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THE
PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

VOLUME XIX.

EDITED BY G. WHARTON SIMPSON, M.A., F.S.A.

Nulla recordanti lux est ingrata.—MARTIAL.

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PREFACE.

THE Nineteenth Volume of the PHOTOGRAPHIC NEWS, to which these after words will stand as Preface, is the record of the observation and experiment, the discussion of theory, and statement of practice, of a year of unusual activity in many departments of our young but rapidly progressive art. The Preface to a volume serves many varied purposes: sometimes it is necessary to affirm the very right of existence claimed by the book; often it affords opportunity of preparatory explanations; and occasionally it assumes the tone of apology for sins of omission or commission which the book may contain. Our Preface has none of these purposes. The pages which have been issued from week to week have, we hope, established their own *raison d'être*, and furnished, in their progress, explanation or apology, if any were needed. We write a Preface, partly because it has become customary, and partly because it affords the Editor an opportunity of speaking to his readers in a somewhat less impersonal fashion than is common in the ordinary forms of journalism.

The completed Volume of the year eighteen hundred and seventy-five is in the hands of our readers, and it needs no comment from us. As regards the future we have no new programme to offer. Our work in the past will be our work in the future. We have aimed to record, with completeness, and, where possible, to initiate or stimulate, progress in every department of photography, and the branches of art and science associated with it. We have endeavoured to aid the research of experimentalists and investigators, and to chronicle the results of their labours; to give wide currency to the teachings of the experience of the ablest practical men; to clear away the difficulties of the student; to announce discoveries and collate facts bearing upon photography in cognate sciences; to enforce and aid art culture amongst photographers; to consider and discuss the social, industrial, and commercial phases of the art; to aid in the advancement, in short, of photography in its every phase as science, art, and commerce, and to consider the interests of those devoted to its practice, amateur or professional—these have been our general aims in the

past; these will constitute our purpose for the future. In saying that we believe we have been successful in the achievement of the ends in view in the past, we do not speak with undue boastfulness, because in doing so we only recognize the efficient services of the numerous adjutors who have aided our work: not simply the services of the gentlemen associated with us on the staff of the PHOTOGRAPHIC NEWS, but the extensive and valued body of contributors and correspondents to whose experiment, observation, and suggestion photography owes so much. To these we gladly avail ourselves of the opportunity of offering thanks for the past; to these we confidently appeal for continued aid in the future.

Of our personal work we need say little, beyond offering the assurance that it shall not in the future fall short of the past. Much of our duty is that of gathering, winnowing, selecting, and garnering; occasionally it is devoted to investigation and experiment; frequently to examination, testing, and proving alleged improvements; often to advice, suggestion, and instruction. We bring to our work upwards of a quarter of a century's practical and experimental familiarity with photography, and a score of years' experience in photographic literature, as well as the keen interest in it which renders the duty a pleasure. With the abounding evidence of the approval of our continuously increasing circle of readers in the past, we can but promise, as the past has been, the future shall be; and, with this promise, we conclude, wishing to all our friends—contributors, correspondents, and readers—a happy and prosperous new year.

January, 1876.

The Photographic News, January 1, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE COLD WEATHER AND PHOTOGRAPHY.—RODWELL'S INVESTIGATIONS OF IODIDE OF SILVER.—MINOR APPLICATIONS OF PHOTOGRAPHY.

The Cold Weather and Photography.—Say what you will about the cold weather, it is, after all, not nearly so bad as the dull, foggy days of November, that try the photographer's negative films, his printing, and his temper. When you have a good covering of snow on the ground, it need not be so bright overhead to make the printing go on merrily, for if the illumination is not very penetrating, the light is bright and diffused, and any description of cliché may be safely put out for printing. One important matter may always be borne in mind in cold weather, a matter first made known, we believe, by Mr. England, and subsequently confirmed by Lieut. Chermiside during his photographic experiences in the Arctic regions. It is this: that one need not be under any apprehension even if the wet collodion film should freeze while in the dark slide, and ice crystals be formed over the face of the latent image. During Mr. England's operations in America and Canada, the film of his wet plate, he has told us, would often freeze in the low temperature, for a long time would sometimes elapse between the plate's withdrawal from the bath and its development. At first he was much exercised in mind, lest no picture should be developed from the glazed collodion surface he brought out of the dark slide; but he paid little heed, and developed in the same way precisely as if nothing had happened. The result was in every way satisfactory, and there was no sign, indeed, in the image to show that anything extraordinary had happened to the plate. Lieut. Chermiside tells us the same tale. Frequently his wet plates froze during exposure, but this did not in any way militate against the result. The only difficulty we should experience about such plates would be as to the use of a warm developer. Thawing the ice crystals too rapidly would, no doubt, be injurious to the image, and the best plan, probably, would be to use a cold developer first and a warm one afterwards. The advantages of a warm developer in cold weather must be patent to all who have used it, and instantaneous pictures may be produced almost as readily in winter as in summer by applying the iron solution luke-warm. The image is developed in a third of the time as when the liquid is poured on almost freezing, and one need scarcely say that to the operator himself the employment of the developer in this condition is all the more pleasant. Should photographers have an objection, however, to their plates freezing in the rigorous weather we are now experiencing, there is a very simple plan for preventing such a state of things. Glycerine, which is sometimes employed in summer for keeping the film moist during extremely hot weather, may be used effectually for the same purpose in winter, for glycerine, be it known, is a liquid which will only freeze at a very low temperature. Indeed, pure glycerine would absolutely refuse to do so in a temperature such as we experience in this country, and it has the effect, when added to water or to aqueous solutions, of imparting to the same a retarding effect as regards their proneness to become solid in cold weather. We need say little on the subject of keeping solutions in working order during the wintry months, for photographers know very well that it is only by maintaining their baths and solutions at a moderate temperature, by artificial warmth, that they can do their work satisfactorily. Otherwise the baths work slowly, the developer is a long time fulfilling its proper function, and the plates betray a general lack of sensitiveness and absence of vigour. However, as we said at the outset, bright, cold weather is in any case far preferable to the

photographer than warm muggy days; and he is generally by no means adverse to a sharp frost and a fine fall of snow, if his negatives are well packed, for not only can he get on with his printing, but there are some nice pictures to be taken on the lawn and in the shrubbery when the delicate twigs of the silver, birch sparkle with frosty rime, and the fir trees appear like petrified fountains overflowing with frozen foam.

Rodwell's Investigations of Iodide of Silver.—We observe that Mr. G. F. Rodwell has been reading a paper, at the Royal Society, on the subject of iodide of silver. He has nothing to say about this compound, so interesting to photographers, in regard to its sensitiveness to light, but, nevertheless, he brings forward circumstances which deserve, at any rate, a passing notice. He believes that iodide of silver exists in three allotropic forms. At a temperature of 116° C. and above it is a plastic, tenacious, amorphous substance, possessing a reddish colour and transparent to light. Below this temperature, and in the condition, therefore, in which photographers employ it, it is brittle, opaque, greenish grey, and crystalline. It may assume yet a third state, and that is when it is fused and poured into cold water; in this condition it is amorphous, very brittle, yellow, and opaque. The compound, Mr. Rodwell tells us, possesses its maximum density at or about 116° C., at the moment before it passes from the amorphous to the crystalline condition. The contraction and expansion of iodide of silver, when passing from one state to another at different temperatures, is said to be very marked indeed. It would have been interesting to know how the sensitiveness for light of the body is influenced by the changes of condition to which we have referred.

Minor Applications of Photography.—Among the many novelties which are prevalent just now in the shape of cards and pictures whereon to exchange the good wishes of the season, it is remarkable that there are none of a photographic character. Snowy landscapes and red-breasted robins are to be seen everywhere, but little winter sketches taken in the camera, which would be most apt and welcome if tastily mounted and finished, are nowhere to be purchased. This appears to us a most singular oversight on the part of photographic publishers, for there cannot be a doubt that the public would pay well for novelties of this kind, well executed, and the productions would be a pleasing change to the floridly coloured pictures which are now only to be bought. Many a photographer possesses half a dozen negatives of suitable subjects, which could at once be made use of, and the large sales which are effected in articles of this kind would assuredly make the matter a profitable one. Unfortunately this is only one of many instances where photographers are lacking in enterprise. There are many directions of a fancy nature, where photography could obtain a footing, if only photographers would make the attempt. For ball programmes, dinner cards, wedding breakfasts, for fancy mats, d'oyleys, fire-screens, lamp shades, and a hundred and one other knickknacks, photography would come in most aptly, if only applied with taste and skill, and a design successfully carried out would surely command a price, if on the score of novelty alone. Why, we have often wondered, has no one among our clever advertisers ever thought of sensitising post-cards, and printing upon them some photographic design or picture? The Post Office would be bound to accept them, as it would printing of any other description. What a field there is here for an enterprising advertiser, for, after all, the cost of such an enterprise would not be very much, when we bear in mind the costly advertisements that are sent through the post nowadays. It is the custom throughout France to send one's address card to friends on New-Year's Day, and the fashion has been adopted with us to some extent of late years. Should it become general what would be more *a propos* than to have the portrait of the sender neatly mounted in one corner? Christmas an

New Year's cards are all very well; but we shall soon get tired of the eternal sprigs of holly and Robin redbreasts, and ruddy children, and laboured rhymes. It is a pretty custom this interchange of good wishes about the beginning of the new year, and photographers might do something to prevent its falling into disuse.

THE PRACTICAL PRINTER IN AMERICA.

CHAPTER XV.

VIGNETTE CAMEO AND MEDALLION VIGNETTE CAMEO PRINTING.

To print these beautiful styles a negative should be made expressly for them, having an ordinary size figure, somewhat smaller than the "Berlin head."

To print in cameo, the same idea holds good as in printing medallions, &c.; i.e., to show sufficient of the body to balance the head, but very little more. A ring made as described below, and called a "cameo ring," should be stuck to the negative that is to be vignettied by the extreme corners, as if you were to print it in the ordinary medallion style, and after placing the sensitive paper on it the negative is then ready to be vignettied.

In choosing the vignette-block or in making the card-board vignetter for it, bear in mind that a much smaller one is needed than if it were to be printed in the ordinary vignette, and consequently pick out such a one as will show enough of the body to balance the head and no more, although we might, if we were not printing this style, choose a block that would blend the print out to the very edges.

The reason why this should be heeded is because the finished vignette print, when pressed by the cameo press, ought not to have any of the halo show beyond the pressed-out surface, if you wish a very fine effect, as is then the case, and the ring being placed on the negative prevents the halo from printing out further than where the ring is placed, and since this ring is made from the cameo press itself, it will, of course, when carefully pressed by it, give us the effect we wished, viz., all of the printed paper is pressed forward while the white border retires. It is almost needless to state that the halo should blend out quite softly, both in the draperies and elsewhere, so that there will not be a harsh appearance in the print, on account of its being stopped abruptly; hence the need of a small but deep printing-board and a piece or two of tissue-paper (according to its quality) for blending it.

In making the medallion vignette cameo, proceed as above, with the exception in the above case that whereas the print is finished as regards the printing when it is removed from the board, in this case there is to be an outside or border printed in, which may be of a variety of shades, as circumstances may permit. In making the cameo ring, place the die of the cameo press on a glass with the paper that you are to make your cut-out of placed under it, and then with a sharp knife cut a quick and clean cut all around the inside of the guide.

In using the cameo ring, proceed as if you were printing the ordinary medallion, and in shading the outside, bear in mind to use the right mask for the cut-out used in printing the prints. (See Medallion and Arch-top Printing.) If the background is very light, the border should either be lighter or darker, but never of the same shade.

When the prints made are medallion cameo, and are not printed in the vignette, then the background is darker than what it would be if vignettied, and consequently the border can be printed lighter than the background; but when, as is very often the case in printing the prints in vignette, the background is very light, then the border is generally printed until it bronzes, so as to give it a decided contrast; this produces an effect quite pleasing.

A new (or revived old) style, more especially for the Imperial card, but can be used in the smaller card printing, has lately come in vogue. The negative is printed in a vignette, feathering out very softly, until the medallion which was previously placed on the negative (varnished side) stops it, but very faintly so, and then a faint border of the same shade as the very edges of the halo is printed, and the print when finished is very fine.

The exposure to the light, when printed as just described, should only be about two to three seconds—a second more often spoiling the print.

There are a number of cameo presses in the market.

The beauty of the above styles of printing seems to be generally acknowledged by at least the patrons of the galleries in which I have printed, if one might be allowed to judge from the orders that were continually being given for them.

ON THE PRACTICE AND PRINCIPLES OF THE GREAT PORTRAIT PAINTERS.

BY A. E. ALDRIDGE.*

If I had proposed only some seven or eight years since to read to a body of photographers a paper on the practice and principles of the great portrait painters, it might have been asked, and with no little show of reason, "What have we to do with the practice of artists, whether great or small?" When photography first started into existence but little more than thirty years ago, it was a something between chemistry and conjuring; and even now among the vulgar, who are ignorant of the means by which its effects are produced, it has still much of its ancient character. The great improvement in the character of photography, and especially of English photography, is generally ascribed to the exhibition of the works of Adam-Salomon, in the year 1847. As many of you have never had an opportunity of seeing these, our friend, Mr. Simpson, to whom we are indebted for their original exhibition, has kindly promised to show some of them to-night.

As photography progressed, one discovery following upon another not only proved the practicability of the new art, but pointed to a not very distant future when it might proudly take its place by the side of the sister arts of painting and sculpture; or, as some of its votaries thought, displace them altogether. This rivalry with painting, and especially with portrait painting, naturally conferred an unpleasant feeling upon the followers of the latter art, many of whom, and especially the weaker or younger members, like Othello, found their "occupation gone;" hence the origin of that apparent opposition between what are called the fine arts and this their younger sister—greatly, as I believe, to the detriment of both. Upon the whole, it is surprising that photography and painting, working side by side for so many years, have yet exercised so little influence upon each other. The artist still goes on making the studies for his pictures in the old laborious way, apparently ignorant or careless of the assistance photography might afford him, while the photographs of the present time, although still much in advance of those exhibited some few years since, yet appear (with some splendid exceptions) still wanting in those art qualities that raise the work of our hands from a dull copy of the commonplace in nature to what in the best sense of the word we understand by a "picture."

If I may be allowed the expression, too many of our photographs appear to be wanting in brains. The author has been content to allow the lens to think for him. That huge Cyclopean eye sees things in many respects differently from the way in which they are presented to our double vision; much more does it differ from the eye of an artist. In the

* Read before the South London Photographic Society.

first place, our friend is colour-blind; it cannot distinguish yellow from black, or blue from white. Then it is utterly wanting in discrimination; it dwells upon the buttons on your coat, the pattern of your trousers, or the wrinkles in your boots, and depicts them all with the same mechanical exactness with which it shows the lines of thought in the face of the sage or the smile on the lips of beauty.

"If you want to find out the faults of your picture," said Benjamin West, "set a student to copy it; he is sure to find and exaggerate them." It is the same with the lens. With what remorseless severity it seeks out and displays those freckles almost invisible to the naked eye! How it turns the rosy cheeks of youth and health to blackness and heaviness, stealing at the same time all force or expression from the eyes that are inclined to blue or grey! Truly a blind leader for the blind! What has been said with respect to fire may be applied to the photographic lens—"it is a good servant, but a very bad master." It requires to be studied, to be humoured, and often to be corrected. And here it is that the artist-photographer has the advantage over his less enlightened brothers. Knowing well what ought to be the effect, he is not satisfied with the first view the lens may afford him, but strives by the disposition of his background, by casting the light upon one part or sinking another in shade, by skilfully disposing his draperies and accessories so as to form graceful lines, to reduce what was before a chaos to order and harmony. It is in the hope of affording some slight assistance in this direction that the following observations have been written.

And here I should like to bestow a few words of thanks on those masters of the photographic art who have so liberally contributed the results of their skill and experience to their less fortunate or more juvenile brethren. I think that we owe them a deep debt of gratitude, and I, for one, tender them my most hearty thanks. As it is chiefly the purpose of the present paper to establish a few of those art principles that may be most useful in our practice, I shall say no more upon the historical part of the question than may be necessary to a right understanding of their practice.

Portrait painting, as we understand it, was but little practised by the ancients. The Greeks, who excelled as artists all other nations, whether of ancient or modern times, when they wished to transmit their counterfeit presentment to posterity, generally preferred the more enduring marble or bronze of the sculptor for the purpose. We are told, however, that Alexander the Great sat to Apelles, the greatest artist of antiquity, for a full-length portrait. As the Emperor had something the matter with one of his eyes, the painter turned that eye to the wall. I suppose that it is scarcely necessary for me to commend this piece of ancient practice to your attention. Alexander certainly approved, for he presented the painter with a sum equal to about £50,000 of our money. It is also of Apelles, if I remember, that another story is told. Having exhibited a picture, exception was taken by a shoemaker to the way in which the sandal was hid; the painter altered it. This so elated the critic that he began to find fault with the anatomy of the foot. "Let the cobbler stick to his last!" exclaimed the indignant artist—a saying that has since passed into a proverb. It is recorded of another Greek artist that, having painted a picture in which some accessories (dead game, I believe) were greatly praised, he immediately painted them out, unwilling that they should distract the attention from the principal object. This was true art. It may be safely said that, whether in a painting or photograph, if any secondary object draw away the attention from the principal, it had better be left out altogether. The Romans never excelled, either as painters or sculptors. All their great works were either carried off from Greece, or executed for them by Greek artists.

(To be continued.)

DRY PROCESSES.

BY M. A. DAVANNE.*

It is easy enough to work with the wet collodion process in the studio, where one has room for placing baths and utensils conveniently to hand, but it is different when you have to photograph in the open air. Although numbers of tents and portable laboratories have been from time to time devised, these form bulky and heavy baggage to drag about with you, and consequently photographers have lately turned their attention to the preparation of dry plates producing sensitive films at home which may be carried a distance.

The different methods of preparing dry plates are very numerous, but we will only take notice of those which are most practised, and which give the best results. These are, in our opinion, the collodio-albumen, or Taupenot process; the tannin process; the waxed paper process, almost obsolete at the present day. In all these processes the point of departure is the same, viz., to obtain a film of iodide or bromide of silver in a permeable and insoluble medium; but whatever may be the nature of the medium or the preparation which is dried, the excess of nitrate of silver concentrates, and reacts upon the insoluble salts of silver, forming crystals of iodo-nitrate of silver, complete spoiling, therefore, the prepared surface. Moreover, the nitrate of silver reacts upon the organic matter of the sensitive film, and, altering it, renders the development a good result impossible. For this reason it is necessary, as a first condition, to wash the prepared plate to remove the excess of nitrate of silver, and the consequence is an immediate diminution of sensitiveness. For this reason the dry processes are slightly less sensitive than the wet collodion process, although considerable progress has recently been made in this matter.

As a second condition, it is necessary to maintain the permeability of the film, and for this reason one cannot employ the ordinary collodion film simply washed, for, on drying, it loses its spongy texture, and becomes transformed into pellicle impermeable to liquids; for this reason it gives a superficial image only, without any vigour, because none of the reagents can penetrate the thickness of the sensitive film. A very old collodion, containing pyroxyline of a pulverulent and inferior quality, gives a more open film, more permeable to reagents, and permitting of being employed dry, after simple washing; but the result even in this case is always inferior to those obtained by the processes we are about to describe.

The general principle in preparing dry plates is to leave in the pores of the collodion a soluble and permeable substance, which may, on development, be replaced or saturated by liquid reagents. The number of substances that may be used for the purpose appears unlimited; a gum-like, gelatinous, albuminous, saccharine, and deliquescent bodies may be used with more or less success, so long as they have no secondary action upon the sensitive film; thus beer, milk, wines charged with tannin, syrup of sugar, glucose, tea, coffee, tannin, gallic and pyrogall acids, albumen, gelatine, caseine, deliquescent salts, &c. have been tried; and from numberless essays it would seem that the best results have been obtained with albuminous substances, of which the white of egg is the type, and with bodies containing astringent principles analogous to tannin, like tannin itself, the gallic and pyrogall acids, tea, coffee, &c.

The Taupenot, or Collodio-albumen Process.—The preparation of collodio-albumen plates is rather a lengthy and difficult process, but its difficulties are compensated for by the constancy of the results, and the clearness and vigour of the results obtained.

After the glass plates have been cleaned with the greatest

* From the Photographic Course at the Paris *École des Arts*

care, a preliminary coating of very dilute albumen, previously filtered, is applied to the surface. The albumen is poured on like collodion, but if it will not flow regularly, a few cubic centimetres of ammonia are added, rendering it alkaline. It is necessary in this operation, as in all those that follow, to prevent contamination from dust with the greatest care. After the albumen has been applied, the plate is put to dry upon a glass drainer, and then put away into a grooved box until wanted.

Any good collodion may be applied; but if landscape work is to be undertaken, then it is well to add a larger proportion of bromide (say 0.25 or 0.50 of bromide of calcium) for every 100 cubic centimetres of iodised collodion. The collodionised plate is sensitized in a seven per cent. nitrate of silver solution, which should be freely acidulated by eight or ten drops of nitric acid for every hundred cubic centimetres of the bath.

After immersion for three or four minutes, the plate is washed in distilled water in three successive baths, and then covered with iodised albumen prepared in the manner following:—

White of egg	...	...	100 cub. cents.
Glacial acetic acid	...	...	1 cub. cent.
Water	...	...	10 cub. cents.

Stir the mixture gently until it is well mixed, let it remain for a few hours, and then decant the clear portion, and pour it through a filter, or a bit of sponge, or a tuft of cotton wool previously wetted. In this way a very lumpid albumen is rapidly obtained.

Take of the above albumen	...	...	100 cub. cents.
Iodide of ammonium	...	...	1 gramme
Bromide of ammonium	...	...	0.50 "
White sugar	...	...	2 grammes

If the rooms in which you are working are a little damp, when it is necessary to replace the sugar with double the amount of dextrine diluted with a little water.

This solution of iodised albumen is filtered through paper several times, if necessary, to obtain a liquid perfectly limpid. Upon the sensitized plate, well washed and drained, there is poured, upon the upper portion of it, a band of this prepared albumen. This is extended over the whole surface by gently inclining the plate, and, after the liquid has been made to flow two or three times over the collodion film, it is drained off. The plate is allowed to dry in a vertical position, sheltered from dust. The albumen solution may, at a pinch, be used a second time; but it is well not to resort to such an economical proceeding.

When in contact with the soluble iodide contained in albumen, the plate loses all sensitiveness; it may be exposed to light without inconvenience, and all the operations above described may, therefore, be conducted in a self-lighted chamber. The dry-plate, when finished, should present an opaline and brilliant appearance.

If put into a grooved box well sheltered from the light, the prepared plates may be kept for an indefinite period. Before they are put away, a cloth, or moistened paper, should be passed over the backs, to remove any impurities that may have dried on the reverse side of the plates.

The sensitizing of the plates is conducted in orange or yellow light, by immersing the plates rapidly and at one motion in a bath of aceto-nitrate of silver. It is made up as follows:—

Distilled water	...	...	100 cub. cents.
Crystallized nitrate of silver	...	...	7 grammes
Glacial acetic acid	...	...	7 cub. cents.

The plate is allowed to remain in this bath, without being disturbed, for thirty seconds, and is then withdrawn by the dipper, and washed with much care successively in three

baths of distilled water; the plates are finally rinsed under a fine stream of water, and allowed to dry. Thus prepared the plates may be employed within forty-eight hours. If it is desired that they should preserve their sensitiveness for an indefinite period (two or three months, or even more), it is necessary, after rinsing, to flood the plate twice successively with a half per cent solution of gallic acid, or even a saturated solution, and allow the film to dry. It is necessary to be careful, in dealing with this last named substance, that the fingers, if soiled with gallic acid, do not touch other plates during the sensitizing or washing operations. For this reason it is well to have two operators engaged on the work.

The exposure of these plates is, as we have previously explained, very variable, according to the instruments used, the nature of the objects, and the illumination at the time. In ordinary landscape views the pose varies generally from one to six minutes; in dry processes, however, a very great latitude in the duration of pose may be given, the errors of exposure being compensated for by a greater or less length development, and by adding more or less silver to the developing solution. If the plates have not been treated with the gallic preservative, the development should follow within a few hours of the exposure. Generally, the development commences of itself, and the image is in part visible before one begins to apply the solution. The developing solution is prepared of

Water	...	...	1000 cub. cents.
Gallic acid	...	...	2 grammes.
Pyrogallic acid	...	...	8 "
Glacial acetic acid	...	...	15 "

If the weather is cold, enough of the developer for a plate is warmed to a temperature of 30° or 40° Cent., although this precaution is unnecessary in mild weather. For every hundred cubic centimetres of the liquid there is added two cub. cents. of a three per cent. solution of silver; this mixture is effected, and the solution put into a bath in which the plate is contained. The development is conducted gradually, and it is necessary to agitate continually to prevent the formation of black spots, which are produced whenever the developer is allowed to remain undisturbed upon the plate. The best plan is to put the necessary quantity of liquid into a clean glass dish, which is slightly tilted, and, having put a spot of sealing-wax at each corner of the plate, to put this face downwards into the solution. The development then goes on very regularly, and the face of the plate is prevented from touching the bottom of the dish because of the points of sealing-wax.

The coming of the image should be carefully watched. If it appears too hard, from under-exposure, the proportion of nitrate of silver is diminished, and the dose of developer augmented. If, on the other hand, the image appears too uniform, then the extra quantity of nitrate of silver is added to make the contrasts more marked. As soon as the image appears sufficiently developed (which happens after a lapse of time varying from ten minutes to several hours), it is washed under a current of water, and fixed in a twenty per cent. solution of hyposulphite of soda.

As the fixing takes place upon a film which is but slightly impermeable, the operation is longer than in the case of wet collodion plates. By looking at the plate by transmitted light the fixation of the film is easily watched. Finally, the plate is, of course, well washed. As the film is hard, and not easily injured, it is possible to print, without risk, a copy, first of all, before varnishing, so that some idea may be gained of the vigour of the image, and, if necessary, the cliché may be intensified further, adding a little more acetic acid to the developer in the first place.

Recent Patents.

[PHOTO-ENGRAVING AND BLOCK PRINTING.

BY J. H. BANKS.

THE following specification describes a method of producing photo-intaglio plates, such as are used in copper plate printing, and photo-relievo plates, such as are used in typographic surface printing:—

"The object of my invention is mainly to produce from a drawing upon paper or letter-press, copper plate, or lithographic print or drawing, a raised surface block applicable for type printing, or a plate similar to an engraved copper or steel plate applicable for printing by the ordinary copper plate or lithographic press; the raised surface plates can be produced either flat, or they may be cylindrical, for the purpose of printing upon calico and such like purposes, metal dies to be used as seals, or for stamping paper and such like uses, or to be used as embossing plates for bookbinders for stamping or embossing book covers or leather, or other substances in high relief, or for other purposes connected with the printing, bookbinding, die sinking, or embossing trades where printing or embossing is used.

"To produce the above results, either from a drawing, letter-press print, photograph, or any work of art on paper or painting I first obtain a photographic negative in the ordinary way by means of a rectilinear lens and ordinary camera upon glass (No. 1), except that I lastly develop it with a solution of bichloride of mercury, wash this off with cold water, and then put iodide of potassium, wash this off with cold water, and then put hydrosulphuret of ammonia, say one drachm to two ounces of water, for the purpose of making all the white parts in the print or drawing as opaque and black as possible on the glass, so that the sun or artificial light used in printing the design upon the prepared glass No. 2 (which I hereafter describe) shall not act upon the white parts, but only on the drawing. I afterwards prepare a glass No. 2, by laying it perfectly flat, and, according to the quality of the lines or work on the design, so I make the thickness or thinness of the film of gelatine or chondrine, which I prepare as follows:—I take two ounces of gelatine, chondrine, best Russian or French glue made from the pates of the buffalo, or from parchment cuttings, and cut it into small shreds, and then pour upon it one pint and a-half of cold water, and let it stand until it is dissolved, say about ten hours, and then gently make it hot, not to boil or burn, and after laying the glass flat I pour on the glass, if twelve inches by ten inches, three ounces, and then leave it to dry; after it is dry I then make up in a bath a solution composed of one ounce of bichromate of potash, or other bichromate or peroxide of chromium, to one quart of cold water, with about half a drachm of hydrate of lime. I then place the glass containing the dried gelatine film upon it into the bath, taking care that the mixture covers it entirely, and when it has remained in three or four minutes I take the glass out and put it on its ends to drain and dry, taking care that no daylight enters the room, only gas or dark yellow light. When this prepared glass No. 2 is perfectly dry and the film hard I take an ordinary pressure frame with a plate glass front, and on the plate glass I lay the photographic negative glass No. 1, with the silvered side upwards, and upon this side I place the film side of the glass No. 2 upon it, and then I place a piece of black velvet upon the back of glass No. 2, press the whole tightly together, and expose the glass to the sun's rays or to magnesium, electro-magnetic, or other white light for about five, ten, or twenty minutes, and then I obtain a printed impression—that is, the design upon the negative glass being transparent, and the white parts being black. The sun or other light can only go through the transparent parts, and so converts the printed portion of the gelatine into an almost insoluble compound, leaving the white portions perfectly soluble; I then take it into the darkened room, and having prepared a bath composed of hot water two quarts, mixed with chloride of sodium one ounce, and by brushing the gelatine with a brush all the white portions wash away, and the design is left on the glass standing up untouched. I then immerse it for five minutes in a bath composed of acetic acid one ounce, and cold water one quart, for the purpose of hardening it, and afterwards take from it a plaster cast, from which a second plaster cast can be taken, and printing surfaces be prepared from it as herein after described.

"The mode, however, which I prefer is, instead of using hot

water, to use cold water, one quart mixed with ten grains of iodine or sixteen grains of iodide of potassium from a quarter to half an hour, then take it out and put it into a bath of cold (two quarts mixed with twenty drops of ammonia) for about a quarter of an hour, then take it out and place it in a bath of two quarts of cold water mixed with one ounce of acetic acid for about five or ten minutes, to harden the edges of the design that have not been raised up. By this means I obtain a gelatine surface mounted on glass, and having the white portions of the drawing raised up to a very great height—quite as high as any wood engraving is cut in depth, and the drawing is level and sunk; the gelatine surface has also been strengthened and toughened, so that a cast can afterwards readily be taken from it, whereas heretofore the casts taken from gelatine plates have been very imperfect. I then mix some plaster of Paris or cement, and take a cast which gives the design raised up and the white portions indented, similar to wood engraving. Should any of the white portions not be sufficiently deep, I then proceed to deepen them. One method I have is to roll over the raised portions of the plaster cast a mixture of printing ink and copal, or some one of the varnishes now in use commercially, and when dry I dip the plaster mould into a bath of very weak soap one part, and cold water five hundred parts, and brush away with a soft brush the unprotected plaster, and afterwards I harden the plaster with weak alum and pyrogallie acid and water until the air bubbles cease to rise from it. Another way I have is to cut away with a gouge all the whites that are not sufficiently deep enough; but if I require to take a casting in plaster of Paris for stereotyping purposes, I do not use the soap water, but harden it by immersing it in a bath of hot size, a little treacle, and peroxide of chromium, until the air bubbles cease to rise from it, and then expose it to light; and while wet I lay a frame upon it, pour in the plaster of Paris, and just before it sets I put it under pressure, and the loose water being pressed out gives a much sharper casting.

"If an electrotype is required instead of a stereotype casting, I then take the plaster cast that has been taken from the gelatine film, and soak it in cold water, until bubbles cease to rise from it; I then make the face of the plaster hot by placing it over a gas flame, and put a frame on the face, and pour on it a preparation of hot wax mixed with resin and lard, which mode I prefer, and thus take an impression in wax from the plaster mould; I afterwards polish this wax impression in the usual way with blacklead, or coat it with metal by using mercury. By washing the mould with spirits of wine, and, when nearly dry, allowing the fumes of mercury to settle on the face, I get a metallic covering which readily receives a surface of copper without being brushed, whereby the fine lines are kept intact.

"To produce a copper plate similar to a copper plate engraving, I take a negative with the lights and shades reversed, and by adopting the same portion of the process of glass 1 and 2 which relates to the printed representation on glass No. 2, and raising the surface with acetic acid only, I then take a plaster mould, and by taking an electro-plate, I produce a copper plate as thick as an ordinary engraved copper plate with the drawing indented, exactly similar to an engraved plate which can be printed by the ordinary copper plate press. For some work I modify the mode by not taking a negative, but by placing the print in contact on glass No. 2; it acts as the negative, and after it is reproduced on glass No. 2, and proceeding as already described, a plate is produced which can be printed from in the ordinary manner.

"Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that I claim as my improvements in the production of printing surfaces and of engraved metal surfaces applicable for other purposes.—1. The combined process substantially as herein described for the production of raised surfaces applicable for type printing and other uses. 2. The combined process substantially as herein described for the production of engraved plates applicable for copper plate printing and other uses. 3. The use of a bath of bichromate of potash or other bichromate or peroxide of chromium with hydrate of lime added to it for sensitizing the gelatine plates. I also claim taking a cast from the plate, as herein described, without removing the gelatine from the glass. 4. The toughening of the raised gelatine surfaces by the means substantially as described. 5. The preparation of the plaster casts by the means substantially as described prior to taking a second cast or wax impression from them. 6. The pressing of the plaster just at the time of setting, when taking plaster casts from gelatine plates or casts taken from them, as herein described. 7. Imparting a thin film of mercury to the surface of the gelatine plates, plaster casts, or wax impressions, by the means herein described to prepare them for electrotyping."

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PHOTOGRAPHY IN 1874.

A BRIEF glance at the photographic history of the year should be instructive as well as interesting. It is important to ascertain what actual progress has been made, what practical gains are available to the photographer, and to what extent they have been adopted in general practice. Photography has undoubtedly been active during the year, and some progress has been made; but no specific or important discovery distinguishes the annals of the year just past. The advancement of an art is, however, frequently as dependant upon improvement in a multitude of minor matters, as upon actual discovery, and in many matters of important detail photography has been undoubtedly progressive.

The wet collodion process remains practically unchanged, and without the prospect of important change. The preparation of collodion having in this country gradually left more and more in the hands of commercial makers, there is little temptation to experiment with varied samples, and the various commercial kinds possessing almost all desirable qualities amongst them, change is scarcely desired or desirable. The negative bath inevitably exercises the photographer continually; but whilst various modes of treating its ailments are proposed from time to time, no radical change in its constitution has been adopted. There has been a growing tendency to work the silver solution in a neutral condition, and a proposal by Mr. F. Eliot to use it in a slightly alkaline condition, employing a coloured sample of collodion, is well worthy of attention, as promising immunity from many troubles. The developing solutions employed remain as usual, a diminishing tendency to much intensification being general.

Portrait photography has not undergone much change. The production of pictures with a large proportion of shadow, or half shadow, especially on the face, which has been distinguished as "Rembrandts," has become more general. The use of gelatine and collodion to produce what is termed an enamel surface, with or without the "cameo" treatment, has also prevailed during the year. Large portraiture has also been more prevalent, an especial impetus in that direction having been given to portraiture by the prizes munificently offered by Mr. Crawshaw. The production of enlargements has also received considerable attention, and has attained a very high degree of excellence, the use of enlarged negatives obtained by the aid of fine textureless positives on albumen or carbon tissue having largely superseded enlargement on paper, with or without development. Mr. Croughton's method of producing an enlarged transparency, admitting of modification by means of the pencil, as an aid to the production of a perfect enlarged negative, is also successfully practised. A method

of enlargement which has received much favour in Paris has been patented by M. Lambert. It consists in producing an enlarged negative from a carbon transparency. The negative so produced is thin and delicate, like a glass positive, all the intensity being derived from a subsequent process of retouching, which is effected by working on transparent paper, covering thin negatives on both sides. To skilled hands the process is easy and rapid, and the results very successful.

Dry plate photography has received much attention during the year, and has made some progress, especially in modes of development. The strong alkaline developer introduced by Colonel Stuart Wortley has been extensively adopted, and is found very valuable with various other processes besides the urano-bromide process, to which it was originally applied. Emulsion processes have received much attention and some improvement. A method of preparing the collodio-bromide of silver without excess of the haloid salt, or of nitrate of silver, by precipitating the solid portions of the emulsion, washing, and re-dissolving in ether and alcohol, promises much success. Rapid bromide plates, emulsion and otherwise, have been produced with much success in commerce. Gelatine promises to acquire an important position in dry plate work, considerable progress having been made in preparing emulsions. Mr. Kennett has introduced a dry sensitive gelatine pellicle into commerce, which simply requires solution in water to render it fit for use. Some discussion has arisen on the patent acquired for this preparation, which need not be considered here; the chief point of importance to the photographer being found in the fact that the pellicle itself promises to be successful, negatives of great excellence and an unusual degree of rapidity being attainable by its use.

The use of diffused light as a means of reducing camera exposures has received considerable attention during the year, and a more general recognition of its value has been the result of extended experience. The use of coloured light, which has been held by some careful investigators to possess an occult value, has been generally abandoned. The most general and successful method of applying light consists in exposing the sensitive plate, whilst in the camera, to diffused white light, modified and softened by placing a piece of opal glass (for convenience fitted in a wooden cup) in front of the lens for a few seconds prior to exposing on the sitter. A general agreement amongst those who have tried it in portraiture prevails as to the fact that it gives harmonious pictures with short exposures.

The discovery announced by Dr. Vogel at the close of last year as to the property acquired by films of bromide of silver, when treated with certain colours, of becoming sensitive to the usually non-actinic solar rays, has been the subject of some experiment and much discussion during the year. The result has been that the discovery—at first much questioned—has been, on further experiment in various hands, confirmed and accepted. Its practical applications, it is probable, may be found valuable.

Printing processes have received considerable attention during the year, but little modification in the ordinary methods with salts of silver has been effected. Modes of eliminating the remaining traces of hyposulphite from the print after washing have been much discussed, but nothing distinctly novel has been introduced. The use of acetate of lead has received considerable discussion, the general tendency of opinion amongst those who have tested the question being in favour of its use. The use of a strong solution of alum immediately the print has left the fixing bath has been proposed in America, and highly approved by experienced men. Its operation appears to be analogous to that of sulphuric acid, proposed in our pages by Charles Martel many years ago; but its use is probably attended with less danger, although it is doubtful whether the print will escape the risks attendant on the decomposition of the hyposulphite in the manner proposed. The

precise and careful application of known modes of fixing and washing appears as yet to furnish the surest safeguards against change in the print.

Carbon printing has improved, but has not, probably, extended much in general application. Methods of photo-mechanical printing have acquired more precision in the hands of those who have devoted attention to their development, photo-collographic processes having attained a high degree of perfection. A more extended and general commercial application of press photography is also manifest.

One of the important features of the year is the general introduction of the powder process of reproducing negatives. The principle, which is many years old in its application to the production of enamels and carbon prints, was first employed as a means of reproducing a negative, direct from a negative, without any intermediate stage, a few years ago; but did not acquire general attention. Early in the past year, in a paper read before the Vienna Photographic Society, Herr Obernetter stated that he had successfully used it for reproducing thousands of negatives of large size. The subject rapidly excited attention, and has been successfully applied. Incidental advantages are derived from its use, as a means of modifying ordinary negatives either in intensity, or by introducing new pictorial features, as proposed by Mr. Werge. The new powers it places in the hands of the photographer will probably prove very valuable.

An important feature in the photographic history of the year is the power the art has placed in the hands of astronomers in recording important phenomena. Its application in the recent Transit of Venus has been attended with a degree of success which has transcended the hopes entertained. Perfect success has attended the photographic operations of various observing expeditions in different parts of the world, and the results are sufficiently valuable to suggest the possibility that photography may supersede other modes of observing similar phenomena. It is worthy of remark, that amongst the most successful photographic results, are those of Captain Abney, who relied on the use of dry plates and strong alkaline development.

Photographic societies have been active during the year, and some new societies have been established which promise to be successful. A serious schism arose in the Photographic Society of London at the close of last year, which at one time threatened the destruction of the Society, but which, after continuing for about six months, accompanied with much bitter discussion, subsided; some slight modification in the laws of the Society, and a considerably weakened cohesion amongst its members, being the chief issue of the strife. The ostensible origin of the dissension was a desire for a revision of the laws of the Society, and as the existing authorities expressed a perfect willingness to aid in such revision, it is inexplicable, on looking back, how such a disruption could have arisen. All the officers having resigned, they were, with one or two exceptions, re-elected to office by a *plebiscitum*, a modified code of laws was passed, and, with a view to render the Society more comprehensive in its aims, the name was changed from the Photographic Society of London to the Photographic Society of Great Britain. If the general spirit of unanimity and co-operation at present apparent continue to prevail, it is possible that the Society may recover its former stability and usefulness. The South London Society continues especially prosperous and active, and is acquiring a metropolitan rather than a suburban character, in the important technical exhibition it holds towards the close of the year, to which a large number of photographers from all parts flock for information.

The exhibition of the Photographic Society, held somewhat under difficulties, was successful, although, perhaps, scarcely in the progressive ratio of former years. A fine collection of excellent photographs was exhibited, the most notable feature being the fine show of enlargements

printed in carbon, exhibited by the Autotype Company. A finer display of large pictures of a permanent character was never exhibited. Not less in interest, and more varied in character, was the noble array of large direct pictures and enlargements competing for the prizes offered by Mr. Crawshay. A fine display of landscapes, also, competing for similar prizes, was not so transcendently excellent as the temptation might have elicited.

A glance at the results of the year suggests the conclusion that photographers might, with advantage, endeavour to break new ground, or carry research more ardently into some channels which have already been indicated by former pioneers. The salts of silver still form the basis of general photographic operations. The use of bichromate of potash has, of late years, been steadily extending in connection with permanent and mechanical processes; but here the practical applications of the art stop. The salts of iron, of uranium, and various substances which have given promise of photographic value in years gone by, receive but little attention. We have seen some admirable prints in various colours, of the permanency of which there was little reasonable doubt, produced during the year by Dr. Diamond, by various combinations of salts, in which uranium and ferridcyanide of potassium played important parts. Dr. Schnauss has developed images on iodide of mercury during the year. M. Saint Flourent, M. Ducos du Hauron, and M. Vidal, have given attention during the year to polychromic photography by different methods; but the number of investigators in untrodden fields is too few, and the concord and co-operation is insufficiently general, to secure rapidly the valuable results which might arise from more systematic and more united research.

VENDING SECRET PROCESSES.

THERE are few subjects upon which the Editor of a photographic journal is more frequently requested to give an opinion than on the value of various secret processes offered to members of the fraternity "for a consideration." As a rule, it must be obvious that he cannot with propriety give any opinion whatever. The business of a photographic journalist is to give publicity to everything he can learn in connection with the art, and he generally avoids receiving information to which he cannot, in virtue of pledges of secrecy or considerations of good faith, give the publicity of his pages. Hence journalism and secrecy are antagonistic. It must, however, be admitted that the process-vendor very often supplies good consideration for the fee he charges; not always because he sells a secret, or something which has never before been published, but because, out of many methods of effecting a given end, he has, after careful proving, selected and verified the best, saving to the busy professional photographer the task and time of searching and verifying for himself. Valuable formulæ are often passed over unnoticed by readers of journals, until some startling evidence of their value is thrust upon their attention. The powder process for reproducing negatives and for modifying negatives had been published some years, but few photographers had given it attention, and fewer still had tried it, until Herr Obernetter announced last year that he had successfully reproduced some thousands of negatives by it, and verified his statement by the exhibition of results at the Vienna Society. A skilful process-vendor might, no doubt, twelve months ago have honestly obtained many fees for teaching the process, which is one of real value. Without entering further into the question of secret processes and the policy of purchasing them, we commend to the attention of our readers a brief communication on another page, by Mr. Young, of Llandudno, whose excellent work in the last exhibition many will remember. Mr. Young's suggestion is analogous to that made in our pages some months ago. He urges upon photographers interested in the progress of

their art to combine for the purpose of testing novelties, and then recording experiences. How many suggestions lie dormant for years for want of the examination and endorsement which only combined effort can give, experience alone will prove. We commend the idea to our readers.

THE EFFECTS OF LIGHT AND HEAT ON IODIDE OF SILVER.

An interesting paper on the effects of heat on iodide of silver, and incidentally of the effects of light, was recently read before the Royal Society, by Mr. G. F. Rodwell, F.C.S., F.R.A.S., some abstracts from which will prove very interesting to photographers. The paper commences by a quotation from Professor Clerk Maxwell, to the effect that iodide of silver is the only solid body which is an exception to the general rule that heat expands bodies, and further cites a remark by M. Fizeau, stating that this body offers an example of the complete inversion of an ordinary law, as its volume very decidedly diminishes when subject to heat, and expands when made cold. Water and fusible metal (bismuth) are of course well known to expand under the influence of cold, but in both these cases a change of state is simultaneously effected, whilst no such change occurred in the case of iodide of silver. In proceeding to his experiments for testing this peculiar property, Mr. Rodwell obtained examples of iodide of silver by different methods:—(1) By precipitation. Pure iodide of potassium was added to nitrate of silver, both in dilute solution. The precipitated iodide was thoroughly washed in the dark, slowly dried, fused in a porcelain crucible, and cast into cylindrical masses, either in a warm porcelain or brass mould. (2) By dissolving pure silver in strong hydriodic acid, evaporating to dryness, fusing. (3) By exposing pure silver leaf for several hours to the vapour of iodine produced by spontaneous evaporation.

Before examining the effects of heat upon the iodide, Mr. Rodwell thinks it may be well to say a word or two concerning the action of light upon it, as a considerable amount of misconception appears to exist in regard to this fact; and in verification of his statement he cites the opinion of various authorities. Gmelin says "it turns brown on exposure to light, but less quickly than the chloride;" Miller says "it is but slowly acted upon by light;" Fizeau describes it as "noirissant lentement à la lumière;" while Vogel ("Jahresbericht," 1863) affirms that if it be precipitated with excess of iodide of potassium it is scarcely affected by light, whereas if precipitated with excess of nitrate of silver it changes colour, but undergoes no chemical change." "The general idea," the author adds, "that it is nearly as sensitive to light as the chloride, has no doubt arisen from the fact that iodides and chlorides are known to have many points of resemblance, and that the iodide is largely used in photography; moreover, we remember that a thin film of iodide of silver was the sensitive medium in the original Daguerreotype. But we must bear in mind that the change produced by light is not apparent until the so-called "developing solution," which contains reducing agents, has been employed. The change is indeed most obscure. The author of the article on Photography in Watts's "Dictionary of Chemistry" says of it: "The atoms have apparently acquired a certain degree of mobility, in consequence of which, when submitted to the action of reducing agents, such as ferrous sulphate or pyrogallio acid, they suffer decomposition, the silver being reduced to the metallic state, and forming an opaque metallic film on the parts of the surface which have been exposed to light."

The following were the experiments made by Mr. Rodwell to determine the degree of sensitiveness of the iodide to light:—

a. By means of a large lens the rays of the electric lamp were brought to a focus within a glass cell containing a solution of iodide of potassium; a solution of nitrate of silver

was then introduced by a pipette at the apex of the cone of rays. The precipitated iodide possessed its usual pale yellow colour.

b. Freshly precipitated iodide in suspension, with a slight excess of iodide of potassium, remained in the full glare of a July sun without undergoing any perceptible change; neither did it subsequently darken.

c. Freshly precipitated iodide in suspension, with a slight excess of nitrate of silver, underwent no immediate change on exposure to a July sun. At the end of an hour it had become slightly grey, and subsequently darkened.

d. Organic matter in the shape of starch-paste did not induce any change when mixed with freshly precipitated iodide in suspension with a slight excess of iodide of potassium. Albumenized paper with iodide precipitated upon it did not undergo any immediate change.

e. Some dried and powdered iodide was found to have acquired a slight greyish metallic tinge after an hour's exposure to the sun. A freshly broken surface of fused iodide became very slightly darker after exposure to the sun. A very pale microscopical crystal of iodide, removed from the interior of a crystalline mass, became slightly brown after several hours' exposure to diffused light.

f. Crystals of iodide of silver produced by direct solution of silver in hydriodic acid were not affected by light; neither were crystals of hydro-silicic iodide (Ag. IHI), nor crystals of argento-potassic iodide (Ag IKI).

g. A sheet of silver leaf was exposed to the vapour of iodine (produced by spontaneous evaporation) for five minutes; it possessed a faintly yellow tinge, which on exposure to the sun instantly became pale green, but on further exposure returned to its original pale yellow. A second sheet was exposed for ten minutes to the vapour of iodine; it acquired a golden-yellow surface, which on exposure to diffused light acquired a purplish-red colour, and on exposure to the sun became greenish purple. On continued exposure this colour disappeared, and the plate returned to almost the original yellow colour.

h. A sheet of silver leaf was exposed to the vapour of iodine for half an hour, at the end of which it possessed a decided golden yellow colour; on exposure to the sun it instantly acquired a dark purple colour, edged with green at those parts least exposed to the direct vapour of the iodine. On continued exposure the purple became paler, but the sheet did not return to its original yellow colour.

i. A developing solution composed of ferrous sulphate, alcohol, acetic acid, and water, when applied to the exposed sheets of g and h, which had been purple, but on continued exposure nearly regained their original colours, produced a reddish-brown colour.

j. A sheet of silver leaf was exposed to the vapour of iodine for many hours; it was found to be converted into a slightly coherent film of lemon-yellow iodide. Light had no effect upon it, even after long exposure to a July sun; neither was any colour produced on the addition of a developing solution.

The pure iodide of silver would thus appear to be scarcely affected by light, except when silver is present, either in the form of nitrate, or, as in the case of the silver films, as metallic silver.

We shall return to the effects of heat on the iodide in our next.

FRENCH CORRESPONDENCE.

DESPITE the incontestable advantages of glass clichés, it is well known that for some time past, substitutes have been proposed to obviate many of the inconveniences that this heavy and fragile substance possesses. Several photographers have made use of other vehicles for the collodion, and M. Silvy is one of those who have gone back to the use of waxed paper. One of my correspondents, M. Quiquerez, has recently communicated an idea on the subject, which merits at least to be seriously considered.

He takes a pellicle of collodion similar to that employed in carbon printing. This is moistened in a bath of alcohol, and then washed with distilled or rain water. The pellicle is then carefully pressed in a blotting pad, after which it is floated upon a bromo-iodized albumen bath. The latter may be rendered more adhesive by the addition of some suitable substance.

After decalcification, the albumenized sheet is floated for a few seconds upon a bath of aceto-nitrate of silver, and afterwards again washed with rain water, as in the case of waxed paper. After removing the excess of liquid by pressing between blotting paper, the sheet, while still moist, is attached by the margins to a sheet of cardboard, as is the case with the dry papers of M. Marion. In this way the sheet is stretched out in a most perfect manner, and it is then exposed in the usual way in the camera. The image is developed either by means of gallic or pyrogallie acid, or even with the aid of an alkaline developer.

In this way we secure a cliché which has, besides the quality of transparency, the triple advantage of not occupying any space, of being extremely light and not fragile, and which, moreover, may be printed from the true or reverse side without trouble. The important point is to determine whether the film of collodion and albumen is sufficiently strong to resist the different operations which the film has to undergo.

It is probable that these pellicles may be preserved for a long time after they have been sensitized, by covering them with a tannin preservative, or with the gallo-albumen compound in the same manner as dry plates are prepared.

The Academy of Sciences received at its last meeting a communication respecting which I must say a few words. It was upon the subject of the action of hydrogen upon nitrate of silver in solution. This action has already been the subject of study on the part of MM. Merget, Roussel, Pellet, and others. Both M. Roussel and M. Pellet have obtained some conflicting results, for while the first declares that hydrogen reduces silver in solution, the second states that the gas has no action whatever. M. Pellet attributes the reduction observed by M. Roussel to a trace of arsenic in the hydrogen employed, or to an excess of oxide of silver in the nitrate.

M. Béketoﬀ, the author of the article to which I refer, has employed in his experiments the quantitative method; and so as to be able to measure with accuracy the amount of silver reduced, and hydrogen absorbed, he allows the experiments to continue for a long time, the action of the hydrogen being excessively slow.

The hydrogen employed was obtained by means of zinc which contained no arsenic; moreover, the gas was purified by passing through a tube containing pumice stone impregnated with a solution of nitrate of silver, prepared with re-crystallized salt from an acid liquor, and slightly dried. The solution of silver salt and the hydrogen were contained in sealed tubes enveloped in several sheets of paper and placed in a horizontal position in darkness. The results obtained and the exact figures are contained in a table joined to M. Béketoﬀ's communication, and prove that the reaction is a simple metallic displacement, and that for every molecule of silver salt reduced, there is an absorption of an equivalent quantity of hydrogen, and formation of free acid, which is proved, moreover, by the fact that after the experiments all the liquids are found to be slightly acid.

The author concludes from these results that pure hydrogen reduces silver in the same manner as other metals in a neutral or slightly acid solution.

Just as the year is closing, it is well, perhaps, to cast a glance behind at the number of works that have been produced during the last twelve months. The period has been very prolific in France, and if we have not to record any absolutely original discovery, we have at any rate had the pleasure of making known numerous improvements in various phases of photographic art.

Thanks to the ingenious modifications in manipulation and retouching by M. Lambert, photographic enlargements have become more easy of production, and have attained also a degree of perfection which till now was denied them. The process, under the name of Lambert-type, is now carried on on such a large scale that it is within the reach of the humblest provincial photographer. Without the least aid from an artist, it is possible to produce portraits enlarged, superior to those obtained by other methods at a great expense.

Next to Lambert-type comes the "Reflectoscope" of M. Van Tenac, which allows one to produce a copy direct from a carte-de-visite without having to go through a series of operations, as in the case of the old method. Moreover, sunlight is not necessary for the purpose, and a simple enlarging lamp is all that is required, so that in the evening, or in dull weather, the work may be continued without loss of time. This is an invention of great importance, the value of which will become more apparent every day.

The production of photographs in colour has also made marked progress during the present year. In the first place, the labours of Mr. Leon Vidal, whose polychromic images are well known, must be referred to as being very successful, as exemplified by the specimens recently presented to the French Photographic Society. Printing in colours has become such a practical matter under his hands that in a short time we may expect to find the method practised as a branch of industry. The experiments of M. Ducos du Hauron, confirmed in a most conclusive manner by the experiments of M. Geymet, lead us to hope also for the solution of the problem in a more scientific, and probably simpler, manner.

Photography in pigments has received this year more disciples than it ever possessed since the origin of the process. Already many photographic establishments have adopted this method of printing exclusively for their ordinary work, and if one is to believe the new works of M. Lambert, it may be safely asserted that carbon printing has definitely taken its place in the studio.

Photo-mechanical printing has also made some progress during the present year, and I may cite, among other instances to prove this, the journal called *Paris-Theatre*, which, instead of containing engravings of a more or less successful character, publishes every week portraits of theatrical celebrities printed by the Woodbury Process.

As to heliographic engraving, although the Roussillon process has remained since its publication in the hands of the inventor, and is solely worked by the well-known photo-mechanical printers, Goupil and Co., the process is none the less an accomplished fact in photography, and will doubtless before long be placed at the disposal of the world at large.

ERNEST LACAN,

ABSOLUTE ALCOHOL.

BY JOHN A. SPENCER.

THE preparation of absolute alcohol being attended with some difficulty, and the loss of product usually very considerable, a ready means of preparing it in moderate quantity may not be unwelcome.

The mode prescribed in the Pharmacopœia to prepare absolute alcohol is to separate as much water as may be absorbed by a small quantity of subcarbonate of potash, to pour off the supernatant fluid from the oily solution formed on standing for a couple of days, on to about half its weight of quicklime, and then, after another rest of twenty-four hours or so, to distil it gently by means of a water bath. This yields a very good product, but it is expensive, as the difficulty of removing the latter portion of the spirit from the magma of lime is very considerable.

The method I have adopted, and found successful, is the following:—Take about two pounds of subcarbonate of potash, and heat it to dull redness, or nearly so, in an open iron pan over a clear fire, stirring it to prevent agglomeration.

meration of the particles. Then, having half a gallon of rectified spirit, 60° overproof, placed in a small still of copper or tin, put the potash salt by spoonful at a time, while still hot, though not incandescent, into the spirit, and immediately attach the head of the still, placing a cork in the extremity of the pipe and luting the junction. After allowing it to remain for a day or two, with occasional shaking, distil with the aid of a water bath till spirit ceases to pass over, when about three-fourths of the bulk of the original spirit will be obtained, having a sp. gr. of about .804, which, though not *absolutely absolute*, will contain close upon ninety-five per cent. by weight of absolute alcohol, strong enough for any purpose required for photography. It is well to reserve the first few ounces that pass over, as this is less strong than after the distillation has proceeded regularly. An advantage of this mode of preparation is that the residue in the still is not wasted, but may be put into an open pan and boiled down over an open fire till it has become dry, when it may be preserved in a well stoppered bottle for use on another occasion.

COMBINED EFFORT IN TESTING NEW PROCESSES.

BY J. M. YOUNG.

THAT oft-quoted "strange conservatism," which looks askance at everything new, and to which the fraternity must plead guilty, has unquestionably been the means of putting many a guinea into the pocket of the man with the "secret process." Were we working photographers to assign but a few days in each year to the testing of theories or the working out of practical suggestions, new or strange, the occupation of the secret vendor would be gone. But he it is that tests these theories, that works out their practice; and it is only when he brings us his results and shows us that there is really "something in it," that we are brought to look carefully and to say, "Good; I shall go in for that. How much, eh? Penalty. I don't like that idea." But like it or not, the document is generally signed, and the risk of no end of law business incurred, and the guinea paid. Brown, you see, on the other side of the street, will be sure to have it, if you don't; but what have you got for your money? Something, in nine cases out of ten, that you knew all about before; and you feel ever afterwards that you have a grievance. You declare war with every man with a secret process.

Why is this thus? Let each man answer for himself. Not long ago I saw, in Paris, the slides and coloured glasses which have the credit of producing photographs in colours. There may be something in that. If fifty good men and true were to try, and then report results, something more might be made of it; and this is certainly one game that is worth the candle.

THE SIMPLE COPYING PROCESS.

BY OBSERVER.

A CORRESPONDENT of the *English Mechanic* states: "Blue leaf prints are obtained by floating paper on a strong solution of ferricyanide of potassium, commercially called the red prussiate of potash. They are fixed by simple washing." Here there is evidently some mistake, as, in order to obtain anything like satisfactory results, it will be found necessary to mix with the red prussiate about the same quantity of citrate of iron. With this solution impressions of the form and outline of any leaf, copies of writings, plans, and drawings in outline may be obtained—a clear, clean white on a blue ground—the printing to take place in direct sunlight.

To make the case plain for any one inclined to try the same—Dissolve about two drachms of the iron, and the same quantity of the red prussiate, in two ounces of water. Paste a piece of brown paper round the bottle, and keep the same out of the light. In using this mixture, the best papers for the purpose are Whatman's thin drawing for large subjects,

and any good thick note for small ones. Papers of the thin order, or such as are deficient in sizing, do not yield good impressions. To coat the paper, use a large round camel hair brush. Place the paper on a piece of card or stout millboard, holding it firmly to the same by the thumb of the left hand; with the right hand dip the brush into the mixture, and, commencing at the top, lay on the mixture from left to right evenly and lightly, avoiding all streaks or drippings at the edges. Put the papers thus treated in some place free from dust and out of the direct light to dry. Then place them between folds of blotting-paper to keep them flat, and use them without much delay.

To Prepare Subjects for Copying.—This may be done on thin writing paper (afterwards oiled or waxed to make it transparent), ordinary tracing or clarified vellum tracing paper, or engineer's tracing cloth; horn paper or French vegetable may also be used. Care must be taken that the ink ticket-writers use for making the design, &c., is sufficiently opaque to stop out the light. To ensure this, when the subject intended for copying and printing is finished on one side of the transparent paper or medium, and quite dry, go carefully over it again on the other side, using ink or a good HB pencil. This will be found a necessary proceeding in order to obtain satisfactory results.

With respect to the printing, it must take place in direct sunlight. A photographic printing-frame may be used, or one of the transparent slates sold at the stationers: the only thing required is to remove the piece of ground glass, and insert in its place a piece of thick plain. A very little practice will enable a person to calculate the time of exposure from the tone of the prepared paper. When the same has become a dull dirty grey, with the subject scarcely perceptible, it is then time to remove it from the frame and immerse it in clean water, allowing it to remain for ten minutes or a quarter of an hour. During this time a sort of gradual change will take place, the dirty grey coming out a pure bright blue, with the subject in clear, clean white lines. After washing for a few minutes in another change of water, the proof may be put in any convenient place to dry, when it may be placed under a weight to press it flat, and considered fixed and finished.

If the process be not of any trade value to photographers in general, there are a large number of students, authors, antiquarians, artists, engineers, geologists, surveyors, and others who may find the same of considerable use and service; and many amateurs with time at their disposal may execute various effective presentable subjects in moonlight and snow pieces, together with illustrated cards and designs on note paper, which, if not of any direct commercial value, will be found of interest to many from the simple and inexpensive way in which they can be produced and multiplied.

Some examples of inscribed stones, wayside crosses, ancient doorways, monuments, and a curious copy (the same size as the original) on lead, "The Absolution of Godefridus," Bishop of Chichester, are sent to show the capability of the process from an antiquarian point.

PHOTO-ELECTRIC ENGRAVING.

BY JOSEPH LEOPOLD.*

Director of the National Engraving and Photo-Electric Engraving Institute at Lisbon.

I do not propose to speak of much that is new on the present occasion, but, as the title of my paper indicates, I am going to discuss a subject which is already twenty years old, but which, despite its age, and the fate of the inventor and his process, has not yet become strong and matured, but is still in its infancy.

When Paul Pretsch, in 1854, had brought his invention in the Vienna State Printing Office so far that he had confidence enough to bring it before a larger public, he chose

* *Photographische Correspondenz.*

London as the place where he would bring out his invention and—make his fortune. In a few weeks after his arrival in that city, he found himself supported by several early acquaintances, who interested themselves in his invention, and formed a company to work out the process with an artistic, as also commercial, end in view. The energy of Pretsch brought him and his invention speedily forward, and by hard work and industry he was enabled, in a very short time, to supply many successful results by his process, which not only in England, but on all sides, were the attraction and admiration of experienced men.

The members of the company, however, without knowledge of the affair, or of its artistic and commercial value, only regarded the matter as speculators; and as the process was still too new and impractical to satisfy would-be shareholders, the ideas and hopes of the inventor were not realised. The process of Paul Pretsch thereupon lost its importance in England; it was neglected, and soon quite forgotten. Pretsch exerted himself still, and produced some good results; but his good fortune had forsaken him, and, despite his energy and skilful invention, his results were powerless to ensure him success in a foreign land.

It is not my object to depict the misery which the brave and intelligent man suffered, and with which he wrestled for many years previous to his death in order to secure his daily bread. My purpose is rather to revive the interest which the invention of our countryman awakened, so that, after eighteen years of silence and oblivion, we may carefully study the nature of the process, and value it at its true worth. Some months ago, as a friend of the deceased, I already found myself morally compelled to grasp the pen in striving to prevent the matter from becoming altogether a thing of the past.

Paul Pretsch has, so far as I know, attracted and left behind no other disciple than Duncan Dallas. This gentleman has published only incomplete details of his method of working, and it was necessary, therefore, for myself to go to work on the subject, and undertake manifold experiments, to make myself acquainted with the operations. In these I employed the well-known principles laid down by Pretsch, by means of which, aided by the experience I already possessed of similar processes, I was enabled in a short time to secure successful results as the fruits of my pains.

The advice and assistance of many friends in the matter I have to acknowledge most heartily, especially those of Dr. Emil Hornig.

The process which I shall endeavour to explain, so far as my experiments teach me, and of which I am happy to lay before the Vienna Photographic Society some fruits, is closely allied to the art of engraving. It would receive useful application in every establishment where illustrated publications are produced, and where, at the present time, a larger amount of money is expended in costly drawings and engravings by hand.

The process is as follows:—Paul Pretsch employed (as I do myself) in producing a block for copper-plate printing, an original photographic positive on glass. The production of such a positive and transparent cliché from a negative requires a little special knowledge and experience. Everybody, however, who is conversant with the preparation of photographic clichés would soon become *au fait* in the matter. The operator must take especial care that the picture is uniformly developed and intensified in its shadows and half-shadows. To secure the brilliant qualities of a good cliché to the picture, the deepest shadows must have sufficient transparency, so that the picture, without too long an exposure, can be vigorously transferred to the photogenic film in every part. As support for the photographic process, good white glass should be carefully chosen, which must, moreover, be very flat. The basis for the photogenic substance is another glass plate, which must possess the same qualities. It is easy to understand that the choice of the plate often controls the later success of the work.

The inventor of the process employed, as we know, for

the composition of his photogenic film, glue, bichromate of potash, nitrate of silver, and iodide of potassium. The proportions of the different substances I have set fast after many experiments. I take

- I. 15 grammes of glue (best) in ... 3 fluid ozs. water
- II. 2 " bichromate potash in 1½ "
- III. 1 " nitrate of silver ... 1½ "
- IV. ½ " iodide of potassium... 1 "

V. Eight drops of vinegar, which are added after the other substances have been dissolved and mixed together.

The glue is allowed to swell for some hours beforehand in the allotted quantity of water. As I carefully calculated the proportion of the crystallized substances in proportion to the glue, I lay particular stress upon the calculation of the amount of water for the same, and no tedious failures should take place.

The glue is dissolved in a water bath, as are also II., III., and IV., to which a portion of the warm solution of glue is added. Then III. and II. are mixed together, being thoroughly stirred the while, giving rise to a dark reddish colour. On the addition of IV., iodide of silver is formed in the glue, and for this reason the dark colour becomes lighter. To this mixture I added 8 drops of glacial acetic acid, and then I filtered the whole through a double fold of linen.

This filtered solution is poured upon glass plates, which are dried in an oven in a perfectly horizontal position, the liquid being applied warm upon the warmed plates, a glass rod being used to facilitate the spreading of the mixture. The addition of glacial acetic acid aids in the uniform spreading of the film, and the grain formed is thereby rendered of a finer character. The temperature of the oven should never be very high. A steady heat of 32° Reaumur suffices to dry the plates in a period of from three and a half or four hours.

(To be continued.)

Correspondence.

SHORTENING THE EXPOSURE.

DEAR SIR,—Allow me to recommend all those who are interested in this matter to try the simple expedient proposed some time back in the *News*. It is to remove the stop when the exposure is half over. Thus, suppose it is found that with a certain lens a medium sized stop is required in order to secure the requisite definition, and that the exposure necessary would be one minute. Instead of exposing full time, at the end of a quarter of a minute remove the stop, continue the exposure at full aperture for another fifteen seconds, and cap the lens. This is just half time. Try a plate both ways, and judge the result.

At first sight it seems likely that the removal of the stop would produce some defect in the image: one carefully-made trial will show how groundless is such a fear. The diaphragm must fit the slit easily, of course, and a little drill will make its removal an easy enough affair. In taking large-sized heads and portraits on 18 by 16 plates I have been convinced of the great practical value of this suggestion.

EDWARD VILES.

Pendryl Hall.

Talk in the Studio.

WAYMOUTH'S VIGNETTING MASKS.—Mr. Waymouth has just issued a little pamphlet giving some good hints as to the best mode of employing his useful masks, and citing a large number of favourable opinions as to their efficiency.

PHOTO-BLOCK PRINTING.—The very excellent process of surface printing at an ordinary printing-press, with blocks produced by photography, and known as Dallastype, is, we understand, about to be offered to photographers to purchase by subscription: the precise details will no doubt be duly

announced. Mr. Dallas is, we understand, engaged in producing a reduced fac-simile of the original folio edition of Shakespeare's plays, the negatives being produced from the copy in the British Museum. The Dallatype edition will, we believe, be in royal octavo, and issued in parts.

RESTORING FADED NEGATIVES.—Mr. Colquhoun, of Alexandria, sends us the following:—"Having noticed several times correspondents recommending a yellow negative as giving good results, I fear, if these have been got up as with me—that is, with iodide of mercury (bichloride of mercury and iodide of potash)—they will fade away through time; at least, I have lost two in this way, and in looking over, I can see one or two more on the way. The varnish has been removed by alcohol from one of these, however, and re-intensified with the iron developer and a few drops of silver from the negative bath, and the yellow colour is changed into something like stone, having more the appearance of a collodion negative without treatment. Enclosed is a print before (No. 1), and another after (No. 2); the last rather deeply printed, perhaps, but it shows that the thing can be done."

CYANIDE POISONING.—A deplorable case of poisoning recently occurred in the family of a photographer in Loches, Scotland. The photographer, Mr. Kenneth, had recently removed from Dundee, and some of the chemicals contained in vials had been placed in a pail for convenience during removal. Mrs. Kenneth was emptying the pail of its contents to put them in a safe place, and a child of three years was playing beside her at the time. The mother turned her back for a minute, and the child just then took from the pail a vial containing a solution of cyanide of potassium, drew the cork, and swallowed its contents. The father, who was in bed at the time, saw the child almost in the act, but too late to save it. He immediately ran with the child to Dr. Alexander, who gave it an emetic, but it was of no use, the child having died in the course of twenty minutes from the time it took the poison. The Procurator-Fiscal is making the usual examination. Great sympathy is expressed for Kenneth and his wife under this sore trial.

AOTIC ACTION THROUGH WATER.—The *Athenaeum* says:—"It has been determined by M. Forel that the chemical action of the sun's rays in summer ceases, in the Lake of Geneva, at the depth of between forty and fifty metres. The depth to which the chemical rays penetrate in water has never before been determined. M. Forel has communicated his researches in a memoir to the Société Vaudoise des Sciences Naturelles."

CANINE PORTRAITS.—The *Art Journal* says:—"Mr. James Hughes, an eminent and very able photographer of Ryde, has sent us several photographs of dogs. They are admirably executed, partly, perhaps, because of the purity of the atmosphere, but owing much to the skill and judgment of the artist, who has studied his 'sitters' carefully, and with valuable effect. They are so true as to supply models for any painter, and so numerous and varied as to include almost every class and order of the animal that is emphatically the friend of man. Mr. Hughes does not give us merely their portraits; sometimes he represents them as exhibiting the tricks and winning ways that endear their companionship. An album full of these pictures will be a rare acquisition to the drawing-room and boudoir of those who love the dog, but not to them only; the lover of field and aquatic sports may see the likeness of his favourite, and the lady a copy of her Maltese or Blenheim pet. A more agreeable collection of photographs 'from the life' has never been submitted to us."

TRANSIT OF VENUS.—The following telegram has been received at the Royal Observatory, Greenwich, from Professor Peters, via Wellington, New Zealand:—"Transit observation great success first contact. Photographs, two hundred thirty-seven." Lord Lindsay has also been successful.

To Correspondents.

E. MATTHEWS.—There is no work published in this country devoted to retouching. There was a small book of a few pages devoted to the subject published some years ago in America, but the bulk of it appeared in the PHOTOGRAPHIC NEWS. You will find many articles devoted to the subject in our last half-dozen volumes, and in forthcoming and recent YEAR-BOOKS.

NITRIC.—It is impossible to say what is the precise cause of fogging, without knowing the whole history of the case. The fogging may be, as you suppose, the fault of the nitrate of silver bath; or it may be the fault of the collodion, or of the developer, or of something else. If you have strong reason to believe it is the bath, try adding a little more nitric acid, or use a dark-red uric sample of collodion. Should you find the addition of more nitric acid insufficient, try boiling again; but neutralize this time with carbonate of soda, or a little caustic potash, instead of ammonia. We do not approve of ammonia for addition to a negative bath, for this reason: when nitric acid is added to remove alkalinity, nitrate of ammonia is formed, and, as the salt will hold oxide of silver in solution, fogging conditions are often set up when the cause is little suspected. Cold weather and bad light are, of course, inimical to successful photography. You should keep your dark room and solutions up to a temperature of at least 50°, or from that to 60° Fahr., in order to secure good work; also give full exposure.

F. R. H.—We have an indefinite recollection of having seen such a lens many years ago; but do not remember by whom it was made except that it was a French maker.

G. D. F.—You not state by what process you wish to work on opal glass, whether by developed camera printing or the use of collodion-chloride in the printing frame. By using collodion-chloride you will obtain the best tone. You will find full instructions in several of our YEAR-BOOKS. If you wish to produce an enlarged or diminished image, you must print in the camera in the same manner as you would produce a transparency on wet collodion, and tone with a strong neutral solution of chloride of gold. The formula given in our pages a few years ago for working the eburneum process answers well.

B. G.—Clippings from prints are generally worth saving for the silver they contain. Only the really printed clippings are, however, worth saving; white margins and the trimmings of vignettes should contain no silver at all.

TYRO.—You are fortunate in having had no experience with what is termed the "old hypo toning bath," as although some prints produced by its aid remain permanent, its results were full of uncertainty. It was often a curious compound, consisting of hyposulphate of soda which had been used over and over again, and had silver and chloride of gold added to it. Some photographers trusted to its fixing as well as its toning powers, but careful workers generally gave the print a few minutes in a fresh hypo solution after it left the mixture in question. We do not think that experiments in the same direction will repay your efforts.

A. B. C.—You may not without permission copy the engravings in *Punch*, the *Illustrated News*, and similar works, either for the magic lantern, or any other purpose. The owners of these publications have a copyright in the engravings in question. 2. You will find that gold toning is very useful for copies of prints for the lantern.

ENAMEL.—The prints in question were not enameled, but were mounted on the glass, which gave the singularly delicate and transparent effect to which you refer. You will find details of the method in our forthcoming YEAR-BOOK.

A. SUBACINER.—Pyrogallol acid is not a true acid in the ordinary sense of the word, and does not, like acids, form salts. Certain combinations with pyrogallol acid in some bases have been produced, and termed pyrogallates, but not many. Peluze experimented extensively in that direction, and did, we believe, form a pyrogallate of soda, but we do not remember the formula he employed. Pyrogallol acid easily undergoes decomposition in the presence of alkalis. We should recommend you to apply to some practical chemists, such as Hopkins and Williams, to supply you with what you require.

PHOTO. MECHANIC.—There are various modes of blacking the brass-work of lenses; but the following is one of the best: take four drachms of bichloride of platinum and one grain of nitrate of silver, and dissolve in six ounces of water. Make the brass-work clean, and apply the preparation with a camel-hair pencil. When dark enough, wash the surface dry, and polish with black-lead.

DICK.—The chief objection to a studio with south light arises from the fact that it involves constant change of blinds and curtains, and constant uncertainties, as direct sunlight enters the studio during a great part of the day, whilst a north light is of much more uniform character. If you make up your mind to the increased labour and anxiety which a south light involves, you may by care and skill get some very fine effects indeed.

G. E. R.—The best mode of increasing the body of your collodion is to add a little more pyroxyline; or, perhaps better, a little papyruline, which you may obtain of most stock dealers.

DAY PLATE.—Almost any dry plate process may be used in producing transparencies, but the collodion process is one of the simplest and most suitable. A few seconds to diffused daylight, or a little longer to a gas flame, will be sufficient exposure. Develop with pyro and silver.

Several Correspondents in our next.

The Photographic News, January 8, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY AND THE POLICE—A NEW MECHANICAL PROCESS—IMPROVEMENTS IN COLLOID PRINTING.

Photography and the Police.—We cannot help thinking that far too little use is made of photography by the Home Office—or, more correctly speaking, perhaps, the police—in matters that come under their notice and supervision. Only the other day the correspondent of the *Daily News*, in commenting upon the direful accident at Shipton, lamented that the victims of the catastrophe had not been photographed immediately after the affair, as during the time that elapsed in some cases before identification of the bodies their faces had altered materially. The countenances, we are told, were in the first place placid, calm, and even pleasant to look at, but after a while the features changed very much for the worse, and not only were the poor remains very horrible to gaze upon, but they had also lost a good deal of their character by means of which the identification would be made. The operation of photographing would, therefore, have saved much pain and anxiety to those coming to inspect the bodies, for these need never have been shown at all, unless the portrait of the deceased gave some hopes of the deceased being the person sought for. It would have been very easy to have taken a score of prints and distributed them to the police stations of the various large towns about England, where friends might see them; or the pictures might be sent on application to relatives at a distance for identification, so that these might not be compelled to undertake a long journey that might turn out fruitless. There are many other directions in which the police might make useful application of our art, beyond the mere taking of portraits of prisoners, which is at present the only use made of photography by our guardians of the peace. Photographs of articles lost, missing, or found, if posted in frequented thoroughfares, would materially assist in their being restored to their rightful owners. It would not, surely, be too much to ask that a camera might find a place among the many other requisites of large police stations.

A New Mechanical Process.—A new process, called the *Aubelbruck*, is announced in the German papers, of which M. Aubel, of Cologne, is the inventor. No details are given of what it is, but some information is afforded to us of what it is not. It has nothing, we are told, in common with Woodburytype, Albotype, or photo-lithography; it does not necessitate the use of the galvanic process, nor that of organic bodies, such as gelatine, gum, asphalt, &c., neither is any transfer method made use of. The original negative is said to be transformed direct into a printing block, as hard as steel, from which any kind of engraving or lithograph may be produced. The rapidity with which reproductions may be secured by its means is proved by the fact that a picture was copied and many hundred fac-similes distributed in a couple of days. The process is adapted to the finest work, and will print matter which can only be read by means of a magnifier. From what we hear we should think the process is only calculated to produce pictures in black and white, or copies of matter in type, and the results are no doubt similar to those of the photo-electric method of Duncan Dallas, whose charming little reproductions of the *Pall Mall Gazette* and *Fun* will be, no doubt, remembered by many of our readers. Whether the results are better or worse than these we cannot say.

Improvements in Colloid Printing.—It is very certain that a great stride has recently been made in photo-collotype printing, or Lichtdruck, Albotype, or by whatever name it is called. Till within the last few months ordinary photographic portraits have not been satisfactorily produced from a gelatine block, and the Woodburytype has been the only trustworthy process by means of which any portrait negative of small dimensions has been made to yield prints

at all comparable with silver photographs. Now and then, it is true, we have seen Lichtdruck or Albotype cartes-de-visite which approached very nearly to silver prints in delicacy and gradation, but these were from negatives specially chosen for their peculiar adaptability to the process, such as of ladies in light dresses and gentlemen in summer costume and felt wideawakes. There were no heavy shadows or dark drapery, for as soon as a bit of black velvet or a startling contrast was attempted by the colloid process, a defective place inevitably appeared. In reproducing the finer portions of a picture, in depicting lacework and the more delicate portions of a dress, the process was eminently suited, but the heavier work was done with less success. Recently, however, there have been produced, in Germany especially, results which lead us to hope that the difficulties which have hitherto existed in producing great contrasts have been removed, and we are sanguine that portraits fully equal to those produced by silver salts may be pulled from a printing press. The examples we have now seen are sufficiently numerous to prove that the prints are not merely specimens obtained with extraordinary care and caution, such as might be secured by a combination of practice and good fortune, but are really due to honest straightforward work. If it should really turn out to be the case that photographs in printer's ink of a perfectly permanent character can be produced equal in appearance to the less stable silver impressions, then we have here to record a mighty step in photography such as we have not witnessed for many a day. But it will not do for the collotype prints to be nearly equal to ordinary photographs in appearance; they must be quite as favourable to the eye, otherwise the public will not have them, despite their great degree of permanence. The introduction of such work would work something of a revolution in the photographer's work, for it is scarcely to be anticipated that he will be able to print his own negatives. Let the colloid printing be as simple as possible, good prints will only be obtainable by very skilful and practised manipulation, and it will be quite one man's work to do this and nothing else. A photographer will have to confine himself to taking and retouching negatives, and send them out to be printed by those who make colloid printing their special study, for only in very large studios would it pay to keep a skilful printer constantly at work. To print portraits in this way will no doubt be an expensive matter where a small number of copies only are required, but when it is a question of even two or three dozen, there will be a saving in having recourse to mechanical printing.

ON THE PRACTICE AND PRINCIPLES OF THE GREAT PORTRAIT PAINTERS.

BY A. R. ALDRIDGE.*

We pass, then, to more modern times—to that gradual revival of the arts which took place in Europe during the middle ages. During the fourteenth and fifteenth centuries painting, both in Italy and Germany, but especially in the former, gradually emerged from the cloud of Gothic darkness that had long obscured the taste, design, and genius of art. In the sixteenth century painting in Italy attained a height of glory and perfection unknown in any previous age or other clime, and which has been the envy and admiration of all succeeding times. We are now on firmer ground. The artists have long since returned to their kindred clay, but their genius still survives in their works. Early in the sixteenth century we find living and working together, or about the same time, those great masters whose names have become "familiar as household words" wherever taste and genius are appreciated. To quote the names of Leonarda da Vinci, Raphael, Michael Angelo, Corregio, and Titian is at once to conjure up in the mind of the artist or connoisseur the remembrance of those great representative men who, while giving to the art some grace or beauty unknown before, each in his turn impressed upon it the

peculiar stamp of his own genius. They were all great inventors, and not one of them on his own peculiar ground has ever been equalled. Da Vinci, the earliest of these artists, in addition to his reputation as a painter, was also noted for his skill in sculpture, engineering, and mathematics. He has left many works or parts of works; and his "Treatise on Painting," which has been translated into many languages, is still one of those books most read by artists. The picture he is now most noted for is the celebrated "Lord's Supper," where the Saviour is seated at the table in the midst of his disciples. There is a small picture of Christ disputing with the doctors in our National Gallery.

Da Vinci, Raphael, and Michael Angelo all excelled in form. Da Vinci gave to the human figure a roundness and grace unknown before. He also greatly improved the chiaroscuro, or light and dark. His pictures are finished with extreme care, and the shadows have a particularly lucid effect. Raphael has often been called the "prince of painters," as he is allowed to unite more of the higher qualities of the art than any other. His drawing is free and masterly, and his draperies flowing and graceful. He is allowed to excel all others in expression and in the beauty of his female figures. It fortunately happens that we have in this country, and accessible to all, some of his noblest works. I refer to the famous cartoons now at South Kensington. Raphael did not paint many portraits, but there is much in his works that may be useful to aspiring photographers. Michael Angelo excelled in the sublime and terrible. If Raphael be the Shakespeare, then Michael Angelo may be styled the Milton, or, still better, the Dante of painting. He had the extraordinary fortune to attain to the first place in three kindred arts. As a painter, he produced the "Last Judgment," which is generally allowed to be the sublimest picture of modern times. As a sculptor, he is famous for the colossal figures of "David" and "Moses," casts of both of which may be seen in the Museum at South Kensington. He was also the architect of St. Peter's, at Rome. Michael Angelo did not paint in oil, and never painted portraits; he must, therefore, be dismissed without further comment. Correggio, the next on our list, was particularly noted for grace; the softness and depth of his chiaroscuro serve to distinguish him from every other master. There are three of his pictures in our National Gallery, all of the finest quality—the "Ecce Homo," the "Venus and Cupid," and the charming little "Holy Family," a perfect gem.

The last of those I have mentioned is Titian, the great head of the Venetian school, and acknowledged to be the greatest of all colourists. His portraits are magnificent. It is surprising to note how he who scattered the most brilliant colours through his historical works, till they seem all aglow, should yet, in his portraits, and especially in his male heads, generally exclude all strong colour. The accessories—always simple in Titian—although of the noblest character, are subdued; it is the head that fixes your attention. The figure, the costume, and the accessories are there when you look for them; but they are never allowed to divert your attention from the countenance. This is the more noticeable as the costume of the time was at once elegant and dignified. So anxious, however, was Titian that nothing should divert the attention from the head, that he frequently covered the hands with a dark glove, in order not to have a second light in the picture. If you wish to see the heads of men grave, dignified, and full of thought, with the soul looking through the eyes, you must go to Titian. To quote the words of Shakespeare:—

"The very life is warm upon that lip,
The fixture of the eye has motion in't,
And we are mock'd by art."

Titian, though the greatest portrait painter of the Venetian, and perhaps I might say of any school, was by no means the only one. The names of Giorgione, Paul Veronese, Sebastiano del Piombo, Tintoretto, Pordenone, Bassano, and

others at once recall to the mind of the artist heads full of glorious life—male faces of the most dignified type, and features of female loveliness, which, though wanting the refined and delicate beauty that Raphael or Correggio would have given them, yet smile from the canvas with all the glowing freshness of life and nature. The Italian school, besides leading the way through the paths of art, displayed an acknowledged power and variety not reached by any other school of modern times.

The school of Spain has produced several artists of eminence, the principal of whom are Murillo (the Spanish Raphael) and Velasquez. Both these artists, in addition to their skill as *genre* or historical painters, excelled in portraits. Velasquez, especially, introduced a style that is still quite his own. His works are eminent for their great freedom of handling, for power, freshness, and a general look of nature—not possessing the thoughtful dignity of Titian's heads or the refined elegance of those of Vandyke, but startling by their vigour and truthfulness. There is only one portrait by this master in our National Gallery (a head of Philip IV.), but his characteristic excellences are well displayed in that.

The Flemish and Dutch schools are principally eminent for works to which we commonly apply the name of "genre" pictures—generally subjects of a rustic nature or taken from everyday life. The painters of these schools are generally noted for excellence of colour, skill in chiaroscuro, and knowledge of composition and the grouping of figures. They reduced the principles of the Italian schools to a regular system, and it is to their works that the artist generally goes to learn the principles and mechanical practice of his art. The heads of this school are Rubens (the "prince of painters," as he is sometimes called by his numerous admirers in opposition to the more refined and classical style of Raphael) and his pupil Vandyke. They are both noted for great mastery in the mechanical qualities of the art, were both great colourists, and painted pictures of the largest size, whether sacred, historical, landscape, or portrait. In the last, especially, they both excelled. The portraits of Rubens are painted with great force and freshness of colour. There is at Windsor Castle a room named after him the "Rubens Room," and filled with his works. There is also in the National Gallery a fine portrait of a woman in a straw hat, called the "Chapeau de Paille," from the collection of the late Sir Robert Peel.

What I have said respecting the portraits of Rubens applies generally to the similar works of his pupil, Sir Anthony Vandyke. The latter, however, though generally having somewhat less force, are more graceful in their attitudes, while the faces have more refinement and subtlety of expression. Vandyke settled in this country, and was appointed Court Painter to Charles I., whose features he has transmitted to us upon so many canvasses. Like his master, Rubens, there is at Windsor Castle a room filled with his works, all portraits of the great and noble of the time, and that room is known by his name. The noble head of an old man in our National Gallery, called "Gevartino," has been ascribed to both these eminent painters. Barry remarks of this artist:—"Happily the works of Vandyke are not scarce in this country, and in them you will see admirable examples of what has been urged respecting the beautiful arrangement of light and colours united to all the graces of intelligence, masterly execution, and his style is much more correct and beautiful than that of Rubens." Before leaving the Hague there is another great portrait painter to whom I can do little more than allude, although his works are of the very highest class—I mean Rembrandt. To give any sufficient idea of his works would require a paper in itself. The common idea among photographers respecting this great master is that he always turned his sitters with their backs to the window, and represented them with black faces having a streak of white running down the nose. Truly a comical idea of the painter! I suppose I must have seen 200 or 300 portraits by his hand,

but never happened to come across one of these streaky Rembrandts. He was noted for the great force and brilliancy of his lights, which were generally obtained by concentrating the light (very often he has only one) upon one part, and surrounding it by masses of dark shadow, often bordering upon blackness, but never black. After these foreign masters, if such they be—for I hold with Voltaire, that "*ceux qui aiment les arts sont tous con-citoyens*" (those who love the arts are all fellow-citizens)—after these, however, we may very well devote a few lines to the portrait painters of our own school.

The greatest of these were, undoubtedly, Sir Joshua Reynolds and Gainsborough, the latter of whom was equally noted for his skill and originality as a landscape painter. Sir Joshua Reynolds has been surpassed in his male heads, but his women are, to my thinking, unequalled. There is about them a feeling of grace and beauty, united to a power and easy mastery in the execution that places them at the very head of their kind. I can only mention a few of the finest. Amongst these may be enumerated the picture of the three "Misses Waldegrave," the famous and charming "Nelly O'Brien," who is seated in a rich landscape with the shade of a large hat thrown over the upper part of her beautiful face, the celebrated portrait of the "Duchess of Devonshire" holding up her child, his picture of "Mrs. Siddons" enthroned in the clouds as the tragic muse, and the picture of another great actor, "Garrick between 'Tragical Tragedy and Comedy.'" The pencil of Reynolds ennobled all it touched. However vulgar or commonplace his sitters might be, they always appear upon his canvases as ladies and gentlemen. "*Nihil teligit quod non ornavit.*" Gainsborough is noted for the great force and freshness of his portraits, and the masterly ease of their execution. He studied Rembrandt and Vandyke with great success. There are three very fine examples of Gainsborough's portraits in the National Gallery—"Dr. Schomberg," "Mrs. Siddons," and a masterly rendering of an ordinary head, called "A Parish Clerk." The limits of a paper like this will only allow me to mention the names of the remaining artists of the English school who have best succeeded in portraiture. They are Romney, Sir T. Lawrence, Jackson, and Raeburn, called the Scotch Valasquez.

I will now endeavour to extract from the works of the great painters I have named some principles that may be of service to us as photographers. The first and most important principle that indeed guides and regulates the whole is that of sacrifice. The parts must be sacrificed to the effect of the whole. If a number of objects strike the eye at the same time, and are possessed of equal force, they naturally compete with each other, and thus weaken the effect of the subject. The principle is thus expressed in Dufresnoy's "Art of Painting":—

"Yet if some grand, important theme demand
Of many needful forms a busy band,
Judgment will so the several groups unite
That one compacted whole should meet the sight."

This is confirmed by a note of Sir J. Reynolds. As the head is the most important part of the portrait, so it should first attract the attention. In the best works of the best men the principal light always falls upon the face; and, where necessary, all other parts are subdued so as to concentrate the attention upon it. Painters who work with much less light than is found convenient in photography always light the head from above, and it is held most conclusive to effect that the light should be small. Rembrandt—who is supposed to have derived his first ideas of the striking power of a ray of light in the midst of a mass of shade from the effects he had observed in the interior of his father's mill—has often carried this brilliant contrast to the extreme, so as to show scarcely anything but the head. Northcote, also, in describing the studio of Sir J. Reynolds, tells us that it was lighted by a single window eighteen inches square, the lowest part of which was about ten feet from the ground. Sir J. Reynolds, again, when speaking of the early painters who obtained relief for their heads by bring-

ing the light part of the background against the dark part of the head, and *vice versa*, recommends the contrary practice of Titian, who often relieved the darks of his heads by a still darker ground, thus giving an appearance of great breadth. This plan is in advance of our present photographic practice.

One most important feature of the face is certainly the eye. All the masters I have mentioned succeeded in giving great expression to the eyes—the "windows of the soul"—while, unfortunately, in every large photographic head this has been the weak point. I do not remember one in which this important feature has been perfectly satisfactory. It is also of great importance in lighting the head to place it so that the eye shall be in shade, or at least in half-tint. The next important feature is the mouth. Generally the corners are turned slightly up, which gives a pleased and pleasing expression; if the corners of the mouth are drawn down the face is sure to wear a look of pain.

Thus much for the head, to which, as I have previously observed, it has been a rule among painters that the figure should be subordinated. How far this principle of sacrificing a part to the effect of the whole is to be carried must depend upon the taste of the artist, whether he be painter or photographer. Titian and Rembrandt in some of their works carried the idea so far that little besides the head is to be seen; while, on the contrary, Rubens and Vandyke, whose portraits have more the look of ordinary daylight, allow greater prominence to the figure. The principles I have laid down have not been much followed by photographers; still there are brilliant exceptions. As I have observed, Adam-Salomon was one of the first to apply the recognized principles of art to photography. In this he has been most successfully followed, and I think excelled, especially in size, and the consequently increased importance of the figure, by our excellent member, Mr. Valentine Blanchard. I will pass round three of his studies, and will just call your attention to the way in which the subordinate parts are sacrificed to the effect of the whole—to the brilliancy of the lights and the depth and the depth and gradation of the shadows—in this respect following the principles which I have pointed out as characteristic of many of the great masters, and carried out to the fullest extent by Rembrandt. I have also brought a few specimens of large heads by Mr. Robert Crawshaw, whom I look upon as the greatest in this style of photography. You will see from the way they are signed that he disdains in any way to shelter himself or his works under the name of an "amateur;" and I know no professional photographer with so large and lofty an aim who has less to dread from hostile criticism.

Some of you will probably remember a paper I read at the commencement of the year on the difficulties of taking large heads. I objected to the size given, as being greater than that of nature. Mr. Crawshaw, who reduced the size, kindly wrote to me, stating that my arguments had convinced him, and induced him to make the alteration for the present year, at the same time pressing me again to compete. A death in my family prevented me complying with this wish; nevertheless, I gladly take this opportunity to thank him, and I think many of you will gladly join with me, not only for his compliance in this respect, but for the large and liberal spirit of art that caused him to offer his handsome prizes for competition. Size, in photography, is a very important element in the consideration of the subject, especially where the great mass of photographers have their attention devoted to the production of cartes or other small negatives, which, however profitable to their authors, are almost beneath consideration as works of art. They may be gems; but even a diamond, the most precious of all gems, may be so small as to be almost valueless. It is because the Crawshaw competition has helped to counteract this, as well as the example of the donor, that I look upon it as an era in the art.

In reading a paper on the practice of the great painters to

exhibit specimens of photographs is very suggestive of the dedant who wished to dispose of his house, and carried a brick in his pocket to give an idea of the building. In my case it is even more unfortunate, for it is a brick from another house. That house, however, is the good one of photography, which we all love so well.

PHOTO-ELECTRIC ENGRAVING—(concluded).

BY JOSEPH LEIPOLD.

THE exposure of the dry sensitive film under the transparent positive must not take place immediately after the plate's withdrawal from the oven. The film, which is of a very sensitive nature, is put away for some hours in a dark place, so as to come in contact with the oxygen of the atmosphere, bringing about an oxidation of the coating of glue, which must be regarded as the basis for the formation of the grain subsequently developed in the image. The film must not, however, be left too long, else it loses its great sensitiveness, and yields bad and dull pictures. It is different when the drying does not take place in an oven, but in a warm apartment during (say) four-and-twenty hours, for in this case there is plenty of time for the oxidation to take place. But the latter mode of proceeding is not to be recommended, as the plates are thereby easily injured.

About the time of exposure under the positive nothing of a decided nature can be said, for the nature of the cliché and the intensity of the light for the time being have obviously much to do with the matter. A vigorous positive with strong shadows necessitates a lengthened exposure, but this must only take place in the shade—in a window, for instance, looking away from the sun. The direct sunlight makes the picture hard, the half tones are lost, and the result is worthless. The printing is a difficult matter, which can only be understood after some practice, but still there are rules which should guide everybody. The printing is done in an ordinary frame; the sensitive film is placed upon the positive in such a way that the former lies upon the collodion side of the latter. After a little while, the print will appear gradually, the deepest shadows, however, not showing any details, and this is a sign that the printing has not yet gone far enough. Of the right degree of exposure some judgment may be formed by opening one half of the frame, by which means the picture can be more easily and correctly inspected. Before the details in the shadows appear, it will not do to stay the printing. I expose my plates according to the character of the positive, and the daylight, three to five hours, covering up the more transparent portions of the cliché after an hour or two with a pigment made with lampblack and weak gum water, thus allowing the action of the light to print through the more opaque portions of the positive. In this way the half tones of the picture are secured in very good condition. The work is not difficult, neither need one be very anxious about it, for after a little practice one may easily prepare even a plate of large dimensions in this manner in a few minutes.

If the exposure has been a satisfactory one, then the development of the picture is easy. The liquid employed by myself consists of fifteen parts water and one part alcohol, the latter having the property of dissolving the film scarcely so quickly as water alone. The plate is laid in a bath of this mixture, and after a few seconds quickly withdrawn and placed upon filter paper. On examining the picture it will be found that by this operation only the deepest shadows and more vigorous outlines appear to be grained. It is, however, to be recommended that the complete development of the picture should not take place at once, so that the glue coating does not absorb too much moisture, and the grain resulting be not perfect. The damp image is allowed to dry spontaneously for a little while, and the development and drying is conducted alternately, in a gradual manner, until the details are laid bare. The finished image is then dried in the air for a few hours, and then put into a water bath to remove any bichromate of potash which may still remain in it.

To change a relief of this kind with all its delicacy, by means of the electrotyping process, into a metal engraving plate, it is necessary in the first place to take an accurate mould of the same with some suitable substance. Everyone who has had experience of the process knows how difficult such a task is to perform well, and in this case one has to do with such a fragile and delicate relief, of which a most perfect reproduction is necessary. Paul Pretsch designates this operation as the most difficult of all, and by its imperfect performance was his labour often rendered fruitless. He used to employ some oily or resinous body mixed with gutta-percha, which was rendered fluid by heat, and in this condition poured upon the relief. Six years ago I experimented for a long time with a similar compound, but never succeeded in securing a good mould, and more recent experiments have proved to me that gutta-percha brings with it more trouble than advantage. I therefore tried to avoid its employment altogether, and used a mixture of the following composition:—

1. Spermaceti	...	...	425 grammes
2. Stearic acid	...	...	200 "
3. White wax	...	...	170 "
4. Asphalte	...	...	70 "
5. Graphite	...	...	70 "

I first of all melt the asphalt, and then add 1, 2, and 3; when the solution has been rendered sufficiently fluid by stirring and exposing to a temperature of 70° Reaumur, the proportion of graphite is finally put in.

The advantages of this composition are many. (1). Its fluid character on warming slightly, and therefore its facile setting upon a delicate relief. (2). The mixture hardens when once cold very perfectly, and is solid enough to repel subsequently the action of the graphite and brush. (3). The compound separates easily and of itself from the image. I have tried the composition for the purpose, in all sizes, and have always obtained brilliant and perfectly good clichés.

After the picture has been completely developed by the water bath, it is dried by means of good bibulous paper. If the grain is too vigorous the image appears too high. The gelatine picture swells by reason of the moisture, and this is the reason of the coarse grain. It is necessary, therefore, to diminish the moisture as much as possible, so as to impart to the relief the necessary beautiful granulation and other qualities for printing purposes. This is done by passing a fine brush in all directions over the image, principally in the deepest shadows, so that the relief is in some sort dried and stretched; at the same time the grain becomes finer and more delicate.

In this way the image is made ready for moulding; a framework of metal is placed around it, and from one corner the pouring on of the composition, warmed to melting point, begins. The separation of the mould from the relief is easily brought about by allowing the composition to set and cool to some extent, and then lifting and turning over the glass plate, when it will be found that the mould has begun to leave the image of its own account. It is only necessary, therefore, to lift the glass plate somewhat in order to complete the separation. The facility and ease with which the moulding is conducted, as also the smooth and perfect character of the mould itself, will certainly give satisfaction to the attentive manipulator.

When the mould does not feel warm any longer it can be rendered fit for electrotyping by brushing over with graphite; the image will not suffer by the brush being passed over its surface. The image becomes more brilliant still after this operation, and the electrotyping is proceeded with in the ordinary manner.

This is as far as my work has at present gone, and I may say that it affords me great pleasure to publish the results of my numerous experiments, which have been to me a labour of love, in the transactions of the Vienna Photographic Society. It is my warmest wish that the interest felt in my native city of the important invention of a fellow-townman may remain lively and prosperous for some time to come.

THE PRACTICAL PRINTER IN AMERICA.

XVII.

PRINTING INTENSE NEGATIVES.

THESE negatives generally print "chalky" in the lights, and "inky-black" in the shadows. In a negative that is too intense there is scarcely any detail whatever either in the high-lights or in the shadows. Such a negative then will yield what may be termed bold and vigorous-looking prints, and will in many cases suit the customers, especially some ladies who like to see their faces very white. To a well-educated person nothing is more repulsive, in the way of photographs, than the harsh black and white pictures, without any of the fine detail either in the lights or shades, which are now so universally admired. The contrast between the lights and shades in such a negative is too great, and consequently it should be toned down or softened.

It is well known among most printers that the slower a negative prints the more contrast there will be in the resulting print, and *vice versa*. Such a negative, then, should be printed as quickly as possible. A too sensitive paper will make the contrast all the greater, and our object in this case, then, is to have a paper silvered in such a manner as to obtain a print less harsh than would be obtained in the ordinary way of working. Paper, then, should be silvered expressly for such negatives, and kept separately from the rest, for the paper which would produce fine prints from intense negatives would produce miserable ones from weak negatives. The paper should be silvered only a very few seconds on a weak bath (say from fifteen to twenty seconds on a 35-grain bath for the Berlin brand of paper, for the Hovey brand fifteen seconds on a 25-grain bath, and for other brands say thirty seconds on a 30-grain bath), and fumed just long enough to prevent it from printing the objectionable red colour, which is sometimes quite difficult to manage in the after-operations. After fuming, if the paper is damp, dry it, and then after cutting it up to a suitable size for printing, place it in a box which is labelled "Paper for Intense Negatives," and always use this box for this brand of paper, and then there will be no danger of mixing it with the differently timed silvered paper which is used for printing other kinds of negatives.

We always use the pink paper for intense negatives, for the colour of this paper is of great benefit to the print, as after it is mounted there will be a delicate pink or flesh colour to the high-lights, which will look very much like the flesh, and consequently will tend towards giving the appearance of detail in those parts of the prints that print chalky, such as the face, hands, &c. After having filled a negative-board, containing one of these intense negatives, with a piece of the paper which was prepared for it, we will place it out in the sunlight to print. The more direct the rays of the sun fall on this negative the quicker will it print, because the light will be correspondingly brighter. This is the reason why, when we place a negative out to print in the sunlight, it prints quicker than when placed in the shade, and when placed face up to the direct rays of the sun it will print much quicker than when the rays strike it obliquely, as, for instance, when the printing-frame is laid down flat on the printing-shelf. Consequently I recommend, for very intense negatives, to place the negative-board face up to the direct rays of the sun.

One of the easiest ways to tell when the board is face to the sunlight is to drive a tack perpendicularly in the printing-frame, and in placing the board out to print place it so that the tack will not cast any shadow except where the sun shines direct upon it, and then a place as large as the head of the tack alone will be shaded on the board. The way I generally do is to place the board so that the shadow which is cast by the board will run in the same direction as the sides of the board—i. e., a straight line continuing from the sides of the board will run in

exactly the same direction as the shadow cast. An easier way, perhaps, to do this is to place your finger close to the board, so that the shadow will come on your finger at exactly the place where it commences to extend out beyond the sides of the board. Do this on all the sides, being careful that in getting the shadow right on one side that you do not lose it on the opposite one. When you have obtained the correct shadow, you can with certainty say that, for the time being at least, the negative-board is correctly placed face to the rays of the sun. I very often watch in placing a board out in the sunlight, and move it until I commence to see the light flickering along all of the sides, then I know that the board is all right without the use of my finger. You will soon get used to it, and after the first few times it will not be necessary to place your finger there, and it will only take two or three seconds to place it exactly right with one hand, while with the other you can be taking up another board to place out to print. The advantage of the above plan can readily be seen by those who print those styles of prints known as "Mezzotints."

One disadvantage in placing the intense negatives face to the sun, without either ground-glass or tissue-paper over them, is the liability of there being some bubbles, scratches, &c., in the glass, which would print on the paper, and these would be the cause of great trouble in touching them out in the mounted print. Many times have I been annoyed in the same manner in printing such negatives, and then would be obliged to place a ground-glass over the negatives, if the defects were very small, and a couple if they were quite large, to avoid their being printed. Sometimes even a tissue-paper must be used to fully answer the purpose; hence the consequence of using the best No. 1 glass in making the negatives. Print until the shadows are a trifle darker than you wish them to be when done, and then take the print off and examine it. "Print for the shadows, and let the lights take care of themselves," is a very good motto, and worthy of notice in printing intense negatives. On examining the print, if the lights of the face are very white, so as not to contain much detail, then they should be softened.

There are various ways of doing this, and one of the best in many respects is that of making an aperture full as large as the place to be shaded, in a suitable size piece of yellow envelope-paper, and holding the print in the left hand and the envelope-paper in the right, hold them both out in diffused light, and tone down the blanky whites of the print. Care should be exercised in performing this, as the least thing out of the way will spoil the prints. The paper should always be in motion while out in the sunlight, so that there will not be any sharp line on the print. The place to be softened should be darkened a very little, two or three seconds' exposure to the sunlight, and half a dozen or so more in the diffused rays, being all that is generally required. Never attempt to shade a print in this manner unless the hole in the paper is full as large as the place to be shaded, for with a smaller hole you will most probably spoil it, by shading it irregularly. The shaded place should also be a trifle darker than what it should be when done. Practice will soon render you perfect in this little printing dodge, as well as in other at first difficult parts of printing. I have seen many prints very much improved by this method, and then again I have seen many others ruined.

A print printed in the manner described above from a very intense negative will have the following advantages:—1. It will be a bold and vigorous-looking print. 2. It will present fine contrasts without harshness, and will contain softness throughout. 3. There will be detail, both in the shadows and in the lights. As a whole the prints will be very much improved over what would have been obtained from the negative, providing it had been printed without regard to its improvement.

The Photographic News.

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ELECTION OF OFFICERS IN THE PHOTOGRAPHIC SOCIETY.

As the first step towards the election of officers in the Photographic Society must be taken within the next few days, it may be useful to those of our readers interested in the Society if we briefly state the working of the new laws in relation to election, which come into operation this year for the first time.

Under the new laws the election of the officers will be effected by the ballot of the whole of the members of the Society, and not, as heretofore, by the vote of those only who might attend the annual meeting. The nomination of officers is also left entirely in the hands of members, no house list of new officers being recommended by the existing council as heretofore. Every member of the Society is at liberty to nominate gentlemen to fill all the vacant offices, the sole condition to give legitimacy to such nomination consisting in punctuality in dispatching it, as all such nominations must be in the hands of the Secretary not less than twenty-one days before the annual meeting. From the lists so received the Secretary will prepare ballotting papers, which will be forwarded to every member of the Society, each of whom, having duly received his vote, must send in his ballotting paper to the Secretary in time for the annual meeting. The ballotting papers will contain a complete list of all the nominees, bracketted with the names of their nominators, and the member will erase, before returning it to the Secretary, the names of all but those for whom he desires to vote, leaving of course the full number of officers to be elected. To give this voting the real quality of the ballot, which is, of course, secrecy, the marked paper is to be returned to the Secretary without any name; but in order to identify it as coming really from a member of the Society entitled to vote, it must be returned in a special envelope provided by the Society for the purpose, which will be forwarded to each member of the Society together with his voting paper. These envelopes will all be placed, unopened, in the hands of scrutineers to be appointed by the Society, by whose aid the results will be made known at the annual meeting.

So far as we can see, the course is simple enough, and not open to any kind of cavil on the score of narrowness. Every member is eligible for office; every member can nominate; every member can vote; as the vote is secret, no kind of undue influence or cliquism can easily come into operation. Possibly the objection may be raised to the effect that the machinery is somewhat complicated and extensive for the simple purpose of selecting officers to carry on the business of a scientific society with eight meetings in the year, but as it is possible this elaborate machinery may effect the purpose, and aid in preserving the Society from petty jealousies and divisions, it is probably desirable to adopt it. Another objection which we have heard raised is to the effect that in the absence of a house list, the Society might

find that through the forgetfulness or indifference of the members generally, no nominations whatever had been made, and hence no officers could be elected. This objection is, however, based upon a misconception or oversight. As all the retiring officers except one vice-president are eligible for re-election, these would always stand as practically nominated, should the members generally fail to re-nominate them or to nominate others. There is, however, little risk, we hope, of such supine indifference as an entire absence of nominations would indicate.

The election of this year will differ, not only from all the past, but from future elections. At the last election of officers, on the reconstitution of the Society, all the gentlemen accepting office did so with the understanding that the position was temporary, and that at the next annual meeting a general election, under the operation of new laws, of all officers, would take place. At that election, the first in which every member of the Society had an opportunity of taking part, there were no special nominations, every member of the Society being on the voting list. Now, and in future, nominations must be made, and such nominations must, as we have said, reach the Secretary twenty-one days before the annual meeting in February; that is, they must reach him, addressed to the rooms of the Society, 9, Conduit Street, Regent Street, before Tuesday, the nineteenth of the present month. The offices for which nominations are required are—president, three vice-presidents, a treasurer, and eighteen members of council. In future years six new members of council only will be required, as well as a president and one vice-president, two-thirds of the council, and of the vice-presidents remaining in office, whilst one-third retire in rotation, to give place to new blood if such an infusion be required.

The new laws, which were passed somewhat in haste at a special meeting at the close of the session, may be legitimately revised at the coming annual meeting. Whilst it was manifestly desirable that the revised code, upon which the council had laboured hard, should be submitted to the members before the recess, it was scarcely possible that it should not possess some minor points admitting further revision or improvement. It was enough that a broad principle of liberality was embodied in the new code, which, whether it had proved necessary in practice or not, was desirable to meet the wishes of some members. Any modifications still necessary or desirable are possible at the annual meeting; but it will be necessary for any one concerned in securing such modifications to give due notice of motion at the meeting on Tuesday, in relation to any alterations he may intend to propose at the annual meeting in February.

PHOTOGRAPHIC QUALITIES OF VANADIUM SALTS.

We recently remarked that a large unworked field still remained open for the researches of experimentalists, amongst substances known to be in some degree sensitive to the action of light, but which have not yet been brought within the range of practical photography. Another class of salts has recently been added to the series contained in that extensive field. We are indebted to Messrs. Johnson and Mathey for details of some exceedingly interesting experiments undertaken by Mr. James Gibbons, for the purpose of testing the photogenic qualities of certain vanadium compounds.

Vanadium is a somewhat scarce metal, found in certain iron ores, and also in combination with lead. It seems to have many characteristics in common with chromium, and it is not improbable that its photographic qualities may be found on further investigation to be similar. Vanadic acid, like chromic acid, is of an orange-red colour, and most of its salts are red or yellow. Gelatine, when exposed to light in combination with some of the vanadium salts, becomes insoluble when treated with a solution of nitrate of silver. Paper treated with a vanadium salt darkens under the

action of light, and when treated with silver, gives a vigorous image like some uranium salts. A silver compound of vanadium gives an image which may be developed with salts of iron.

The record of Mr. Gibbons's experiments stands as follows:—

"Potassium divanadate, in combination with organic matter, is first rendered green, and ultimately blue, by exposure to light, being reduced, probably, to the state of vanadium tetroxide. The salt is not sensitive to light in the absence of organic matter. Gelatine, mixed with potassium divanadate, becomes slightly less soluble in warm water after being exposed to light; this is apparent by the unexposed portions of the film swelling and dissolving more quickly when treated with water than the exposed parts. If a colourless film of dry sodium orthovanadate (Na_2VO_3), free from organic matter, be exposed on glass to the sun for several hours, it only acquires a faint brown tint. The film kept in the dark, with access of air for some hours, regains its normal colourless condition. The salt does not undergo any change when exposed to diffused daylight. Paper which does not contain any size of an animal origin, when coated with a solution of sodium orthovanadate, is darkened on exposure to light, the depth of tint depending on the length of exposure and on the strength of the solution used. The tint, however, never becomes darker than a slate colour. If the paper thus prepared be immersed, after exposure to light, in a solution of silver nitrate, the colour in the exposed part instantly changes to a deep brown or to a black colour, varying according to the amount of exposure. A tint of the decomposed vanadate, which is of so slight an amount as to be with difficulty distinguished from the whiteness of the paper, will, by immersion in the silver nitrate, be toned so as to exhibit a very perceptible tint. It is evident that paper prepared in this way might be employed for the purposes of photographic printing. The unexposed parts are converted, by treatment in the silver bath, into yellow silver vanadate. This substance may be dissolved out either by ammonia or by sodium hyposulphite. This act of fixing converts the dark brown or black part into those of a red colour. This may be prevented, to some extent, by using a bath of ammonio-silver nitrate, with an excess of ammonia instead of the simple silver nitrate bath. The developed print can afterwards be toned with gold chloride. The length of exposure required to produce a deep black is about one hour to a strong sunlight: this, by using a solution of the sodium orthovanadate containing about eleven per cent. of the salt. Some ligneous substance only must be present with the sodium orthovanadate for the production of the above-mentioned slaty tint; for if an albuminous body be present, a faint brown tint is produced after exposure to light, and the silver nitrate is not afterwards reduced to any very great extent. The slate colour of the reduced salt appears to be due to the formation of vanadium trioxide. If the exposed paper be kept for some weeks its colour changes to that of a yellowish-brown, free vanadic acid appearing to be produced.

"Gelatine, impregnated with sodium orthovanadate, exposed to light, and afterwards dipped into a solution of silver nitrate, becomes insoluble in hot water. Silver orthovanadate is capable of forming a photographic image, which is nearly latent, and which may be developed by the ordinary ferrous developer used in photography. To produce this image, two or three minutes' exposure to sunlight is required. To develop it, it is essential that little or no silver nitrate be present; otherwise, the exposed and unexposed parts are reduced indiscriminately. The washed silver vanadate can be mixed with a solution of gelatine containing a little albumen, spread upon paper and allowed to dry; it can then be exposed to light, and afterwards developed."

* Communicated by Prof. Roscoe to the Literary and Philosophical Society.

FRENCH CORRESPONDENCE.

SPOTS IN PHOTOGRAPHIC PRINTS—BAD CARDBOARD—LEIPOLD'S PHOTO-ENGRAVING PROCESS—MARC ANTOINE GAUDIN—GRANTS TO SCIENTIFIC MEN.

The subject of stains or spots upon prints arising sometimes even during the operation of printing, despite the exercise of greatest care, is still occupying the attention of our photographers, who are naturally very anxious to discover the true cause of this fatality, so vexing both to themselves and the public. For this reason, it is well to take into consideration all the experiences that are made known on the matter, and I propose to bring before your readers a communication which I have just received from M. Bandoux, of Jersey.

This gentleman attributes this peculiar kind of small-pox in photographs entirely to the composition of the cards upon which the prints are mounted, and particularly of those cards which have been manufactured since the war. The proof of this is to be found in the following circumstances:—

M. Bandoux always draws his supplies of albumenized paper from the best Paris houses, and invariably chooses that of the finest quality. He has not changed for some time past his method of sensitizing, toning, fixing, and washing, his manipulations, to be brief, being thus conducted. The positive silver bath is at all periods of the year maintained at fifteen per cent. strength, the dark room where the operation is conducted being warmed in winter. The toning bath is that recommended by M. Davanne, and the fixing with hyposulphite of soda is the process ordinarily adopted. Finally, the washing is organized in such a way as to completely remove from the prints all the hyposulphite that has been absorbed by the prints. To do this, M. Bandoux employs a round dish with a double bottom, 1.25 metre in diameter and thirty centimetres deep. The two bottoms are separated by a space of six to eight centimetres, fitted with a big tap, which permits the water to run away at will, with more or less rapidity. The upper partition is pierced with holes like a sieve, and it is upon this that the prints remain. On two sides of the dish are placed two tubs, but at a higher elevation than this. These are always full of water, and to each is fixed a tap in a slanting position, so that the water is poured in in the same direction against the walls of the bath, and turns the prints continually, forcing them towards the middle of the bath, whence they are again dissipated by a third jet of water in the centre coming from a cistern. The water to replenish the tubs and the cistern is provided by pipes coming from a neighbouring rivulet.

The prints are allowed to remain in this bath for at least six hours, and often all night long, and as the water is running out continually through the tap between the two partitions, no trace of hyposulphite can possibly remain after such a thorough rinsing.

For mounting, M. Bandoux prefers to use a paste made with distilled water and French starch made in Paris. English starch generally contains a blue pigment, and appears to be of an inferior character. The starch is made fresh every day, so that there may be no fermentation.

M. Bandoux draws his supply of cards from the best houses of Paris, and he has pictures mounted eight years ago upon which no spots or defects of any kind have manifested themselves. Not one of those which have been mounted in albums upon coarse paper have undergone the slightest alteration. During the war at Paris, not being able to procure any further supply of card from Paris, he purchased, at Jersey, some common card such as is to be found in all shops. Photographs mounted upon this material have kept very well, but some of the cards bore signs of spots.

After the war M. Bandoux at once ordered from his correspondent in Paris a supply of 20,000 cards, for which he was kept waiting some time, by reason of the number

of orders in hand. After a time, however, the supply was made, and the cardboard was used in the ordinary way. Six months elapsed, and then complaints began to be made on all sides about defective prints, which were full of spots and stains. At first it was believed that the assistant who had charge of the fixing was at fault, but soon it was apparent that the failures took place so regularly that this reason could not be the true one. Then the hyposulphite of soda was suspected, and a supply of the purest material was sent for from London. Despite all these precautions, however, the prints continued to appear with the vexatious spots upon them, and even a change in the albumenized paper made things no better. In short, the portraits mounted on the 20,000 cards were all of them more or less injured after a little while.

Certain facts were tolerably certain. The portraits mounted upon the cards coming from Paris before the war did not show signs of any defect. Those mounted upon thick paper in the albums were likewise free from any of the spots. Those photographs mounted on the common cardboard purchased in Jersey were not all of them in a bad state; and other pictures mounted on larger boards kept in a good state of preservation. Finally, what was very conclusive was the fact that the drawers filled with unmounted prints did not any of them contain spoilt prints, although many of the pictures had been produced eight years ago.

M. Bandoux asks whether some preventive measures could not be taken to preserve the print from the cardboard, by coating the latter with some sort of preservative, and he thinks that india-rubber might be a suitable material for the purpose.

My correspondent adds that for some time past he has used the *colle ramie*, which may be employed of a thick consistence—say in the proportion of one hundred grammes of cement to eighty grammes of water—and in this case mounted prints dried by heat do not become detached.

M. Joseph Leibold, Director of the Photo-engraving Establishment at the National Printing Establishment at Lisbon, has just sent me a collection of specimens by the process, of which the PHOTOGRAPHIC NEWS published a description in its last number. These specimens, which are of a most varied character, embracing both portraits and views, reproductions of monuments, and works of art, are most remarkable in many ways. They possess great detail, much delicacy, an extraordinary relief, and considerable vigour. They may compare favourably with the fine plates produced some time ago by M. Charles Nègre, and at the present day by M. Rousselon. We cannot but congratulate M. Leibold on these successful results, and thank him, moreover, for publishing to the world the method by means of which they have been obtained.

In the letter which accompanies the interesting collection M. Leibold very modestly attributes the best part of his success to the valuable assistance he derived from our mutual friend M. Carlos Relvas, the skilful amateur photographer of Hollegua, whose works are well known in England and France by all those who visit photographic exhibitions.

It is, in fact, with the assistance of M. Relvas' very perfect clichés that M. Leibold has been able to prepare all the plates that are produced in the National Printing Office of Lisbon, and everyone knows that in mechanical processes of this kind the nature of the cliché is a matter of the greatest importance. It is gratifying that the co-operation of these two gentlemen has been productive of such valuable results.

I am sure all the readers of the PHOTOGRAPHIC NEWS will learn with pleasure that a presentation has just been made to our old friend Marc Antoine Gaudin, whose works, especially in the early days of photography, contributed much to its advancement. M. le Baron Trémont bequeathed to the Academy of Sciences a further sum of eleven hundred francs to aid any savant who needed

assistance in work that might accrue to the use and glory of the French nation; this sum has just been awarded to the persevering experimenter to whom we have alluded.

In regard to this matter, I may mention that I have before me the *Comptes Rendus* of the Academy of Sciences of the 2nd Décembre, 1874, which contains an account of the various grants of money distributed on that occasion. It is a quarto volume of not less than 200 pages, and the works which are herein mentioned belong to every branch of science. There are few reports in which the art of photography does not figure. In all kinds of researches the new art has become an auxiliary, and in some almost indispensable. Physiology, anatomy, botany, zoology, chemistry, microscopy, geography, astronomy, all make use of the camera, and every day the application becomes more widespread—the process is so prompt, so exact, and so infallible. In reading the reports one is more and more convinced of the important rôle that photography plays in scientific discoveries, and in this respect, at least, it must be conceded that photography fulfils a most valuable function.

ERNEST LACAN.

THE TRANSIT OF VENUS.

THE EVE OF THE TRANSIT.

AN interesting letter from the Special Correspondent of the *Daily News* at Thebes, understood to be Captain Abney, gives some very interesting details of the preparations on the day before the Transit. He says, dating Dec. 8th:—

To-day a general polish, oiling, and dusting has been given to the instruments. Everyone has been surrounded with small screws, bolts, sperin oil, cog-wheels, brushes, and dusters, from the small hours of the morning. Such a furbishing up I much doubt if half the instruments have ever had before. Then, too, the observers have been concocting miraculous seats which should give them the greatest ease at the critical time. Chairs with legs sawn through, packing cases to make platforms, barrels, spars, planks, and so on, have been "requisitioned," and the whole encampment has the general aspect of being supplied with very Irish furniture. There has been a council respecting the signals to be given to the photographers as to when they should expose their plates for recording contact, and finally it has been arranged that Colonel Campbell and Dr. Auvers should both give signals, and that Captain Abney should be left to decide at the time as to which he should take. The signals themselves are not novel. The colonel, as his profession demands, has chosen the ready means of firing a breech-loader, whilst the learned doctor is to use a tin tub, slung up by poles, as a drum whereon he is to tap. Astronomers I had always looked on as calm, impassive, unexcitable beings; but I have learned to look on them with much less awe since I find that they are not a separate race of men, but are even more than ordinarily affected mentally by absence of sunlight, or the loss of the stars for an evening. Thus, I see out of my boat that they all, one by one, are constantly running out on terra firma to see what to-morrow's prospects may be. If constant watching has any effect on the clerk of the weather, he certainly will be bound to give them a favourable time of it in the morning.

Since I last wrote we have all been hard at work practising on the model transit, both by night and day. The lady astronomer has been most zealous, and her observations, I fancy, will certainly not be inferior to any. The personal difference in observation between each observer has been duly noted, as it has been found that some observe the phase of apparent contact of the limb of Venus with that of the sun somewhat earlier than others. The time of true contact will be deduced as follows:—Dr. Auvers has a model, the exact optical contact of which has been and is daily determined by a small microscope placed in proper position. The sun and planet of course are represented by the model, the former being represented by a circular opening behind which is flashed either sunlight or else lamplight, whilst the latter is simply a black disc moving in front of it, either by clockwork or a slow-motion screw. Each observer takes a turn at the model, his telescope being some 300 yards distant from it, and by signal stops the movement when he fancies contact has taken place. A scale attached is then read, and the number of seconds noted by which he is distant from the true estimation. It is no joke standing by the model in the daytime and adjusting the mirror. A sun which makes a blackened bulb thermometer rise to 145 degrees is apt to feel too warm; and when one has to face this temperature for a couple of hours the desire to serve science, even in a minor degree, becomes rather checked. To-day we have made our arrangements for placing a cordon of sentries all round our camp. No one will be admitted or allowed inside. Even our farmyard companions have been cooped up till further orders, lest

their cackling or quacking should disturb us while listening to the tick of our chronometers. We rather expected a Cook's tourist party to have been here by now; probably had it been generally known that to-morrow was an eventful day in the scientific world, the attraction of seeing philosophers at work might have proved an inducement for getting to Thebes thus early, and have been trying to us. The only Europeans besides ourselves here now, however, are three French ladies; hence we are in hopes that our territory will not be invaded by any Ferringhee pilgrims, and that we shall be left undisturbed. The programme for to-morrow is, a five o'clock breakfast, then a general comparison of chronometers, next a final adjustment of instruments, and arrangement of details. At a quarter to seven the sun will appear, and he will be watched and photographed till a quarter to nine, when the transit of Venus will be finished.

Dating on the 9th ultimo, after briefly referring to the successful results, he proceeds to details of the actual operation. He says:—

This morning, long before daybreak, we all bundled out of our boats, took chronometer comparisons, and adjusted instruments. It was rather cold, and pea-jackets and mufflers were quite necessary to keep oneself warm. As it got near sunrise every telescope was pointed towards the spot where the sun was expected, and at last he made his appearance in a delightfully bright sky. Almost immediately Colonel Campbell shouted out, "Here she is!" and then there was a general finding of Venus. She appeared anything but a promising subject for the purpose at first. She seemed literally to dance about the face of the sun, and her limb was jagged like a saw. They both appeared elliptical in an almost extraordinary degree, owing of course to refraction, and they did not lose it entirely till they at least 7 degrees from the horizon. Gradually the limbs of both got more and more defined till Venus looked like a small black pea resting on a luminous disc. The sun, however, still remained somewhat troublesome, particularly to the photographers, and it was not till just before internal contact that he was really steady. The atmosphere of Venus was distinctly seen at certain periods. It showed as a pale white circle round part of her edge, and was totally different to the brilliant sunlight. The general remark was that it reminded us of moonlight. This caused a certain difficulty in estimating the true time of contacts, and perhaps any small discrepancy in observation may be accounted for by this phenomenon. The critical time for the photographers was when they had to expose for the time of contacts. Colonel Campbell, as I told you yesterday, agreed to give a certain signal, whilst Dr. Auvers literally in part, deprived himself of making a first-rate observation by kindly supplementing it by another. To estimate the proper time for exposing the circular plate which was to bear fifty photographs on its surface without external aid would have been simply a shot and nothing more. As it is, it is believed that the Janssen plate shows photographically very nearly the true time of contact; at all events it bears sufficient upon it to enable an estimation of the true time to be made with comparative facility. Dr. Auvers took 126 measurements of the diameter of Venus by the heliometer, and then handed the instrument over to Admiral Ommanney to observe contact, whilst he stationed himself by the photographic hut with his telescope. There is one curious coincidence to note, and that is that no one seemed to have observed the black drop which has been so much talked about; a faint haze was seen, and a few jets of black springing out from each side of the point of contact, but nothing more. Neither in the photographs did it show, which perhaps might have been expected. I fully expect that the appearance of the faint lines will give rise to a long discussion in the astronomical world. It will be very curious to note what other stations saw. After copies of the photographs have been taken, the photographic expedition will return home.

ON FINISHING AND IMPROVING LARGE NEGATIVES.

BY GEORGE BROUGHTON.

I PRESUME that as Mr. S. Fry has tried and made known his success with the so-called Lambert-type process, others will be induced to try it, and as a few practical directions are always of use in preventing blunders, I purpose in this paper giving my experience for over twelve months, and practical hints as to working.

I say so-called Lambert-type process, because I cannot give up my claim to having published, nearly twelve months before the date of the patent, a method of finishing enlarged negatives by working upon tracing paper upon both sides of the negative. It matters nothing that the main object of my paper was to give practical working directions of a process of making enlarged negatives, which I considered, and still consider, the easiest and simplest in working; what I

say is (and anyone can see if my claim is just by turning to the back numbers of the News, in which my paper was published) that at the conclusion of the paper was a paragraph devoted to various methods I had adopted for retouching or improving the resulting negative, and among them I mentioned that I had found the use of tracing paper on both sides of the negative an easy and artistic method of obtaining effects which I could get by no other means, and exhibited a large-size negative which had been done by that method; and there are more than one member of the South London Photographic Society who can prove that some time before the reading of my paper they saw in my studio, in Shepherd's Bush, enlarged negatives with tracing paper upon both sides, which had been worked upon with pencil and other materials—notably one of the late Emperor Napoleon III., done for the Stereoscopic Company. However, call it Lambert-type or any other name, it is free to all, and it places in the hands of a photographer of taste a wonderfully efficient method of altering and improving large negatives of all kinds, for life-sized direct negatives can be improved, and made more artistic (where they require it) by its use, just as well as enlarged ones; but it is, of course, of most value for improving enlargements.

First, as to materials required. The first and most important is the tracing paper, and here I differ from Monsieur Lambert in preferring a sample that is not transparent, for reasons which will appear in the details of working. It can be obtained at any artists' colourman; I get mine from Rowney's, Rathbone Place. The most important point is to get it of even texture throughout, without cloudiness; it should be clean, and free from opaque spots; and you must be careful not to fold it, or it will crack, and the crack will become more opaque than the other parts, and so cause a light streak on the print. I use pencils of four kinds (H, HB, B, and BB), also powdered lead or plumbago (the best I have used was supplied by Mr. J. Werge, with his process of making pictorial background), cuttle-fish powder or putty powder, and plenty of clean soft carded cotton, or cotton wool.

Having obtained your negative and varnished it in the usual way (and I neglect no dodge or expedient to make the negative as perfect as possible, for in my experience I find this method of retouching, as every other, will succeed best upon good work, and this or any other dodge, will will never make a high class print for a bad negative), the tracing paper is cut to the size, and damped by passing evenly over it a sponge which has been dipped into water, and then squeezed nearly dry in the hand. A brush with the ordinary office gum is run round the edge of the negative for about a quarter of an inch on both back and front (care having been taken to clean the back of the negative of all stains and dirt), and the paper is then brought into contact with each surface. Be careful that the gum does not spread too much. When dry, the paper will be strained quite tight, and present a very agreeable surface for working upon.

We will suppose that the negative to be manipulated is a twenty by sixteen enlargement of a lady in black silk dress; the background is defective in the small negative, and in the enlargement it is very coarse and spotty; the negative has been well exposed, and developed with a strong developer. It is placed on the retouching desk with the negative side to be worked upon first; with the H pencil go carefully over the face, working out spots, freckles, and other inequalities, but doing no more than is absolutely necessary to mend the negative. Taking now the HB, with bold, decided touches I put on all high lights that want decided edges, such as the lights upon the white ruff round the neck, the lace down the front of the dress, all jewellery, the light upon the eyes, &c. Now turning the negative over, I take the B pencil, and put on the high lights upon the face boldly and strongly; the two lights upon the forehead, on the brow, and over the eyes are rubbed in without care for the edges, but with great care that they

are in the right place, down the nose, and upon the chin, and if necessary upon the cheek bone (in these sometimes the B pencil is not dark enough, and the BB will have to be used). Having satisfied myself that the masses of lead are in their right places, and that they are much more opaque than they are required, I take a small tuft of cotton wool, and moulding it into a rough kind of stump, dip it into the cuttle fish powder, and lightly rub over the lead, rubbing harder upon the edges, graduating them into the paper with more powder. We will suppose that the shaded side of the face, and the shadows under the eyes and chin, are too heavy; with the same piece of wool I mix some of the cuttle-fish powder and plumbago together upon a piece of white card, and rub this upon the tracing paper over those parts. You may ask why this is not done with the pencil; but you will find, as I have by experience, that the cuttle-fish powder being mixed with the plumbago makes it take to the paper in a fine even layer, without texture. Any part of the drapery that may want shading may be done in the same way. Now, to get rid of the background, in a cardboard tray made for the purpose I mix equal parts of plumbago and cuttle-fish powder, mixing them well together; rubbing my forefinger into this, I rub it on the tracing paper on the back of the negative, carefully rubbing into the lines of the figure; if this is in some parts too intricate for the finger, I supplement it with the BB pencil. Sometimes the outline requires that the front surface should be worked upon with the pencil, but I find this seldom necessary. I prefer the softened outline obtained by rubbing the plumbago over the edges of the figure on the reverse side to the hard cutting outline, which is the result of working upon the surface which comes into contact with the sensitized paper. You will have noticed that all this work has been upon the lights of the negative. Now comes the manipulation of the shadows. With the prepared gum sold by artists' colourmen, gum down upon the reverse side all deep shades which will make the tracing paper more transparent in those parts, and so cause the light to pass through and give greater depth in the print; this gumming must be done with a large brush, and with great decision. Sharp decided shadows can be made (which are just like decided touches upon the print with a full brush of colour) by gumming the very deepest shade upon the negative side; but it wants some knowledge of drawing to do this with effect. The negative is now ready for printing, which is done in the usual way, with the exception that I take the precaution to cut a rough brown paper mask to protect the background. When printed, the figure is of course upon white background.

I must leave the printing-in of the background, and the expedients adopted for getting effects of light and shade into them, for another paper.

ALBUMEN VERSUS GELATINE, AND FIXING WITH SULPHOCYANIDE OF AMMONIUM.

BY C. DURAND.

It is generally thought that the undissolved albuminate of silver is one cause of a print upon albuminized paper turning yellow. I am not about to deny this, but to relate the following experiment.

I printed, fixed, and washed a print upon ordinary albumenized paper, sensitized in the ordinary manner, one upon my own sensitized albumenized paper, and one upon paper coated with insoluble gelatine. I then suspended the three prints in a large well-corked jar (glass) containing at the bottom water half an inch in depth; the prints did not touch the water by two or three inches. The jar was then placed in a strong light that fell upon the three prints equally. After several months I removed them from the jar, and all three had become slightly yellow from the long-continued action of the damp air. I expected the gelatine print would have kept whiter than the others, but it was quite as yellow as the one on ordinary albumenized paper, whilst the print

on my own paper was whiter than either. This experiment seems to suggest that albuminate of silver may have received more blame than justly belongs to it.

It is also said that as albuminate of silver is not dissolved from the prints by sulphocyanide of ammonium, that salt is not safe as a fixing agent. The following is the result of an experiment I made two years since. I fixed two ordinary albumenized prints, one with hypo soda, and the other with sulphocyanide of ammonium, and well rinsed them for about half an hour. I then hung them both in a strong light, and exposed to the air in a large glass room for nearly a year, and whilst the one fixed with hypo soda had become slightly yellow, that fixed with sulphocyanide of ammonium remained perfectly white, which seems to suggest either that albuminate of silver has been much calumniated, or that sulphocyanide of ammonium dissolves it out of the print.

ENAMELLING CARTES.

BY A CLYDESDALE LADDIE.

CLEAN a plate glass with dry whiting, coat with enamel collodion, varnish the plate with spirit varnish (I find the French Soehnes varnish the best). The plate should now be perfectly transparent, without any streaks. Immerse the print in warm gelatine, about the strength of

Gelatine ...	...	...	...	1 ounce
Water ...	...	...	...	8 ounces

Put the print in contact with the varnished plate. Squeeze out the air-bells and superfluous gelatine with a glass rod. Lay aside in a dry place for one hour, then coat the back of the print with warm gelatine paste. Put the dry mount in contact with the print, and quickly put all in a strong printing-frame, and put as much pressure as the plate glass will bear. Let it remain in the frame for two hours; then take it out and leave in a dry place. When dry, the cartes will leave the glass of their own accord; no heat must be used.

Another Mode.—After the plate has been varnished as above, cover the varnish with a coat of warm gelatine. Immerse the mounted cartes in cold water for a few minutes; roll them in a coarse towel, and, while damp and pliable, put in contact with the gelatinized plate. I sometimes wet the plate with water to draw out air-bells, but I think the most brilliant results are got when no water is used. If the cartes are intended to be raised in the cameo press, the print can be mounted on strong drawing-paper, and remounted after being raised. I have tried all the different modes of enamelling that I have seen in the journals, but found them very troublesome and uncertain. And on seeing how easily a varnished negative left the glass when put in warm water led me to try how a varnished plate would do for enamelling. And I think that if some of our star photographers would give it a fair trial, they would find it more certain, less troublesome, and the result more brilliant.

PHOTOGRAPHY AND THE MAGIC LANTERN.

BY J. H. BIGGS.

PHOTOGRAPHY affords a ready means of producing slides for dissolving views or for use in the single lantern, possessing an amount of detail and a truthfulness which cannot be approached by the most skilful artist, the only drawback to them being the want of colour. By a combination of handwork and photography, however, many excellent coloured designs may be executed, possessing very great delicacy and finish.

I have tried every process for the production of lantern slides which I have heard of, including painting in varnish colours and in water colours, transferring by diaphanic and vitremanie and photography, both alone and with hand-drawing. Of these, water colours may be discarded altogether as being devoid of brilliancy, and diaphanie as superseded by the more facile and satisfactory process of

vitremanie. Some excellent designs are sold for this last by a London firm, but the price—five shillings for a sheet of twelve subjects—is rather high, and the instructions issued for the manipulations are anything but clearly and fully explained. In one paper supplied with the designs directions are given for wetting the glass before applying the transfer, while in another description of the process no mention is made of wetting the glass. Some of the mechanical slides, too, appear to be printed the wrong way—for instance, in the “Court of Beasts,” where the animals are intended to pass before the lion, the latter is printed with the face turned one way and the beasts the opposite; but as the fixed glass having the lion on it and the sliding glass bearing the animals must be used face to face in the lantern, whereby the relative directions are reversed, the beasts when moving forward will come, as it were, from behind the lion, whereas they should advance facing him.

In producing slides by hand in varnish colours the chief difficulty appears to be drawing on the small discs of glass outlines which will bear magnifying to the required degree, without becoming glaringly coarse and obtrusive; photography, however, affords a ready means of getting over the difficulty, and I have found the following methods of applying it produce excellent results. A design of any subject required is drawn accurately and neatly on a smooth white piece of paper, in pencil or Indian ink, within a circle of nine inches or more in diameter, and all the parts of the subject which are to be represented by black, whether in full depth or any gradation, are drawn in; this is then copied as a reduced negative of the size suited to the lantern employed, in the camera and transparencies obtained by the wet or dry plate process or by using carbon tissue. The designs are then varnished with negative varnish, and coloured brilliantly with proper varnish colours.

It will be obvious that the execution of the drawings on paper, and on so large a scale, is a very easy matter compared with working on a slippery glass surface and of only one-third the size. Having made a chromatrope frame, in which the glasses are movable, and one pair may be readily substituted for another, I have used the method described for producing the various patterns.

The transparencies are printed by the carbon process generally, on pieces of thin glass three and a half inches square, and are then cut exactly to the size required for fitting accurately in the revolving brass-work. This requires some care, as it is not only necessary that the disc should be neither too large nor too small in diameter, but the centre of the design and the centre of the disc should actually coincide.

Another way, which I have found very convenient for producing the chromatrope glasses, is to draw the original design on paper in Indian ink on a large scale, and as a negative, all parts to be coloured or transparent being perfectly black. It is only necessary then to take copies in the camera of a size suited to the lantern in which they are to be used, and to cut and colour them as before described.

As an illustration of the application of the method I have endeavoured to describe, I will give the details of a dissolving effect produced by it, which I think is somewhat novel. A swan is drawn in outline with Indian ink on paper, within a circle of nine inches diameter, and shaded to represent the ordinary bird familiar in the northern hemisphere, together with the water on which he swims and the surrounding scenery, the paper being left white in all parts which are to be coloured or transparent. From this two positive transparencies of the exact size required for the lantern are obtained. In No. 1 the sky, water, and scenery, as well as the beak and legs (where visible) of the bird, are appropriately coloured, and the plumage and reflection in the water painted black. In No. 2 the sky and scenery are stopped out with black, also the water,

except the reflection of the bird. No. 1 is shown on the screen first, the swan then appearing as a native of Australia, where black swans abound and a white one would indeed be a *rara avis*. The light from the second lantern, in which No. 2 is placed, is gradually uncovered, and the swan slowly changes his plumage from black to white, the scenery, sky, &c., undergoing no change.

Correspondence.

REMOVING STOP DURING EXPOSURE.

DEAR SIR,—I see by Mr. Viles's letter in this week's News that he has found the great advantage of removing the diaphragm during exposure. The operation is rendered more simple and certain by drilling a hole through the projection on the stop, and tying a piece of thread therein, the use of which is obvious. I have succeeded in moving the rotating stops of a landscape lens during the exposure of dry plates, and the resulting negatives were perfectly sharp, the exposure being lessened from ten minutes to four.

Bollington, Jan. 4th, 1875.

J. BRIER, Jun.

PS.—Here is an idea for the improvement of “collodion-chloride” which may be of interest, as you discovered that useful process. The presence of those very deliquescent nitrates in the emulsion has always been a stumbling-block, and they can be removed in the same way that they are removed from Mr. Bolton's emulsion.

J. B.

[The presence of deliquescent nitrates is at times undoubtedly troublesome when the collodion-chloride is employed for printing on opal glass, and possibly might be got rid of in the way suggested.—Ed.]

TESTING NEW PROCESSES.

DEAR SIR,—May I ask space for a few words in reference to Mr. Young's proposal in your last number, and your editorial remarks on the same subject?

The proposal that every new process should be thoroughly tested and reported upon by competent judges is one which must meet with the approval, not only of advanced photographers, who are, notwithstanding their “strange conservatism,” willing and anxious to adopt any real improvement, but also of every honest inventor or discoverer of a new process which, in his own hands, has proved a success, and which he believes would be valuable to others.

I do not quite agree with Mr. Young that it would be necessary for fifty different photographers to try (and report upon) a proposed improvement, in order that it may be adopted with confidence by others. Surely the verdict of five “good men and true” should be enough to enable others to discriminate between the true and the false.

If a committee officially connected with the Photographic Society could be formed to test and report upon any new process or alleged improvement, it would, I think, go far to do away with “that strange conservatism which looks askance at everything new,” and would be the means of introducing many real improvements, while we should cease to hear the bitter complaints of those who have been victimized by the unprincipled “process-monger.” At the same time, the certainty of being fairly dealt with by an honourable body of men would be a great encouragement to those who have time and means at command to devote both to the task of solving some of the difficult problems met with in the daily practice of photography.

But we must not always expect to reap the advantage of every improvement, and give nothing in return. Depend upon it, the time has gone by for obtaining, without fee or reward, valuable technical instruction and information, which are the result of patient study and costly experiment.

Let the sale of a new process or improvement which has stood the proposed test be recognised as a legitimate and honourable bargain, and the “man with the secret process”

will no longer be regarded as an enemy against whom we must declare war.

Nor do I see any necessity that the inventor or discoverer of a secret process be regarded as an enemy by the photographic press. Should the time arrive when discoveries or improvements cease to be made, no record of progress would be required. I would suggest that if an inventor cannot afford, or does not feel disposed, to give away his discovery, that he should name a certain time during which he desires his process should remain a trade secret, after which let it be freely published and discussed in the journals devoted to photography.

Apologising for occupying so much of your space,—
I am, dear sir, yours very truly, B. J. EDWARDS.

Talk in the Studio.

THE PHOTOGRAPHIC SOCIETY.—At the meeting of the Society to be held on Tuesday evening next, a paper on a very important and interesting subject will be read by Mr. G. Hooper. The paper will be devoted to a review of the origin, aim, and achievements of the Photographic Society, with suggestions for its further expansion. Mr. Spiller will exhibit a new light, possessing considerable actinic value, which promises to be of use in photography. We regret to learn that Mr. Woodbury's illness will again delay his paper on experiments with coloured media.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The first meeting of this Society for the new session, just commencing, will take place at the Rooms of the Society of Arts, Adelphi, on Thursday, January 14th, when, after the routine business, a "popular evening" (to which ladies and friends will be admitted) will be given, consisting of an exhibition, by members and others, of lantern slides, by the lime light, on a large scale. Tickets (free) can be obtained from any of the members, or from the Hon. Sec., Mr. Edwin Cocking, 57, Queen's Road, Peckham.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—A distribution of prizes, something in the manner of an Art Union, is shortly to take place in connection with the Photographers' Benevolent Society. We understand that upwards of 500 prizes will be distributed, chiefly consisting of choice photographs. An announcement in our business columns gives details of the entertainment which will be provided at the annual meeting.

SECRET PROCESSES.—Mr. B. J. Edwards has invited a committee of photographers to test and report upon his secret method of treating the nitrate bath so as to maintain a perfect working condition without change. Such a course proves satisfactorily the absolute confidence which he himself possesses in the excellence of his method, and in the fact that his secret is worth its price.

A "DREAMY PICTURE."—A recent lecturer remarked that "some of these people didn't know their own imperfections, as the fat old lady who said to the photographer—'I want to be brought out light, airy, and ethereal!'—and who was assured by the photographer that she would make a most 'dreamy picture.'"

To Correspondents.

J. NELSON.—It is somewhat difficult to give you full information in relation to the building of a studio, within the necessary limits of an answer in this column. Assuming that you have full command of position, we should recommend something like the following:—Build the studio with a ridge-roof, standing east and west, so that the principal light shall come from the north; let it be 26 feet long, 12 feet wide, 6 feet high at the eaves, and 13 feet high at the ridge. Opaque at each end. On the north side and roof let 6 feet be opaque at each end, the rest glass to within 2 feet of the floor; south roof opaque; south side may have 8 or 10 feet of glass coming, as on the other side, to within 2 feet of the ground. Both ends may then be used with backgrounds, but the background at the west end will probably most commonly be useful. The Belgium sheet glass will answer well—say a 21-ounce glass. It is cheap, but we cannot tell you the precise price.

R. R. PATTISON.—We cannot with any certainty tell you of whom you may obtain views of Llandudno and Weston-super-Mare. Possibly Messrs. Marlon and Co., of Soho Square, could supply you. We believe that Messrs. Cathall and Pritchard, of Chester, have published many Welsh views.

D. BROOKS.—There are several Warwick Streets in London, but we do not know much of them personally. So far as we believe, there is a Catholic chapel in Warwick Street, Regent Street, but we do not know the name of the officiating priest. It is probable that you will obtain all the information you desire from the Catholic Directory, which any bookseller will obtain for you.

K. (Madras).—The yellow discolouration of your prints is due to the use of dishes for washing the unfixed prints which have been contaminated with hypo. The dishes have probably been used before for washing prints after fixation, and slight traces of hypo cling to them, sufficient to cause this yellow discolouration of unfixed prints brought into contact with them. The same cause would prevent any appearance of milkiness when the prints were placed in the dishes. Dishes used for holding hypo, and for washing prints whilst any trace of hypo is present, should never be used for any other purpose.

T. S. M. O.—Registration is of no service whatever in relation to any picture in which you do not legally possess the copyright, and you do not possess any copyright in portraits taken in the ordinary way of business. You cannot prevent a customer getting his portrait, which you may have taken to his order, copied at any place he may choose. To secure a copyright in a portrait you must either have produced it at your own choice, and not to the order of a customer, or you must have secured an agreement in writing with your customer, reserving the copyright to you, and such agreement must be registered at Stationers' Hall.

J. C. S.—The statements in the abstract in question are a little obscure; but it seems probable that the iodide solution should be washed off after flowing.

R. BAILLES.—It is a matter in which we fear that we cannot give efficient advice. If a tradesman be dishonest or negligent, and after receiving cash neglect to forward goods, he risks bringing himself within the operation of the law, we should think; but what form of legal procedure is necessary we cannot say. It possibly may be a civil action to recover the money, or it may be a criminal action for obtaining money under false pretences. A lawyer alone can decide, and that after considering all the details of the case. Possibly further pressure and some patience may meet the case.

G. E. D.—The cases of fading in carbon prints to which you refer were not examples of fading at all. It simply happened that amongst the earliest examples of Swan's process were some in which the image was attached to the paper by some imperfect cementing material, and portions of the image exfoliated. It is possible, however, that pigment prints may fade if fugitive colours are employed in preparing the tissue; but if carbon actually—or, indeed, any permanent pigment—be employed, there is no risk of fading.

R. L.—Glue has been found best for mounting enamelled prints, and the colder it is used the less likely is it to interfere with the glassy surface of the enamel. If the prints are perfectly fixed and washed, they are, we should think, more likely to be permanent after enamelling, as it must preserve them, to some extent, from atmospheric influences.

D. F. G.—We cannot with propriety recommend one manufacturer of commercial dry plates as superior to others. We have given reports at various times of the results we have witnessed, but we cannot undertake to give any comparative estimate of the relative qualities of the plates of different manufacturers.

P. J.—So far as experience has gone, it is much in favour of the plan of removing the stop during exposure. The exposure with full aperture is of course very much shorter than with a stop. For instance, if you are using a lens of two and a-half inches diameter, and with a stop of half-inch aperture, a 50-seconds' exposure is required; with full aperture, 2 seconds would be sufficient. If, then, you give the same plate 25 seconds with the stop, and 1 second full aperture, it should be just as fully exposed, with the incidental advantage of a somewhat softened definition, the result of some spherical aberration. It is doubtless possible to devise some mechanical contrivance by which the stop may be removed without the risk of vibration. A correspondent, suggesting pulling it out with a piece of string. If the lens were slightly twisted round in the flange, so that the stop inclined to one side instead of being quite vertical, it would be more easily removed.

A. PRINTER.—We do not know of any means which will make a gold toning bath to which carbonate of soda has been added keep well. An alkaline solution of chloride of gold very soon precipitates, especially when kept in the light.

T. S. HICKS.—Received; many thanks. The matter shall have our early attention.

RECEIVED "Photographic Mosaics," 1875, and "Wilson's Lantern Journeys."

Several Correspondents in our next.

The Photographic News, January 15, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE RETURN OF THE TRANSIT OF VENUS OBSERVERS.

Now that we have heard of the success, or otherwise, of most of our Transit of Venus expeditions, and are in daily expectations of hearing the results of the calculations based upon the observations made—whether, that is, we are still about ninety millions of miles from the sun, or whether the distance has been grossly exaggerated, or, the other way, very much under-estimated—we repeat, now that the observers have done their work, and handed it over to the calculators to be completed, it is time, we think, to consider how best the services rendered by the enterprising scientific men who went out on our behalf are to be acknowledged. There is scarcely any one of those who have gone abroad who has devoted less than three months of his time to the solution of the great problem. Probably those who went into Egypt were best off, but these have been away from their home during the most unpleasant season for several months, and have suffered many privations in the cause of science which were far from insignificant. But others were worse off still. Even Lord Lindsay's lot, who went out in his own yacht to the Mauritius, under comparatively comfortable circumstances, is scarcely one to be envied, for sailing about in a tiny vessel among the Indian seas would not suit everybody's taste. Then there are those who went to New Zealand; and, less enviable still, the exploring party established on Kerguelen's Land—the Island of Desolation, as it is aptly called—uninhabited, out of the course of ships, with little else but barren rocks and dreary icebergs to meet the eye, and with a coast so stormy and inhospitable, that it is a matter of the greatest difficulty to effect a landing at all. Father Perry, one of the professors at Stonyhurst College, and well known as a careful astronomer and skilled mathematician, is in command of the little party of explorers that have cast their lot on this barren island, which is somewhat indefinitely described by sailors as being about two hundred miles to the south and west of the Cape of Good Hope. Being at such a southern point, observations from this station will be of singular importance, and it is to be hoped that the foggy and moist weather, which prevails here for most of the year, will not have prevented the taking of photographic and other records. Of course we have no news yet from this station, and it may be a month or two before we obtain any, for a ship must be sent out specially from Cape Town to fetch the little party home, and the stormy and treacherous nature of the sea near the Antarctic is proverbial. We can never adequately recompense men who thus volunteer on so hazardous a duty; but let us hope that Government and the Royal Society will come forward to do their best, and acknowledge as well as they can the important services rendered. We know it is the rule of the Royal Society to elect but fifteen new fellows every year, and if this number cannot be increased for once, we hope that this year, at any rate, we may see among the new fellows a large number of those who aided most in the recent observations of the Transit of Venus, and thus contributed towards the solution of one of the most important astronomical problems of modern times.

NOTE ON THE CAUSE OF METALLIC SPOTS IN ALBUMENIZED PAPER.

BY M. A. DAVANNE.*

MANY explanations have already been given of the causes of spots which appear on positive prints, more especially in delicate half-tones and in vignette pictures. To-day I

have to call attention to a cause which I have been enabled to follow out for some months, and which is in perfect accordance with the explanation given by M. A. Girard and myself some time ago, namely, that the spots are due to metallic particles.

Having to produce a large number of positive prints, I provided myself with a ream of paper which furnished me every day specimens of all kinds and classes of spots, so that ample opportunity was permitted of a thorough examination, which, I believe, has guided me to the truth. These spots I found sometimes isolated, although very numerous in the delicate half-tones and in the skies of my prints—sometimes grouped by chance, like a constellation; sometimes, too, they occupied the same relative position, in one or several straight lines. It was this regular state of things that especially attracted my attention, as it could not have happened by chance; for if the spots disseminated in groups might be attributed to metallic particles themselves spread in the bath, such could not be the case with a series of spots affecting the regular form of a straight line, or curve; and it was necessary, therefore, to look about for some extraneous cause.

In the prints most covered with white spots the albumenized surface of the paper does not present any peculiarity. Rarely indeed do you distinguish the central black spot, whence the stain proceeds, from the white halo which produces what we term iron spots; but if you examine the paper by transmitted light with the aid of a magnifier, you will find, as a general rule, the centre of a darker colour, and, turning the print round, you will see a black speck at the back of the sheet. This black metallic spot, of an almost microscopic nature, is formed of reduced silver by another metallic particle much finer still, which is attached to the back of the sheet before it is sensitized. The foreign metal reacts upon the salts of silver, either at the period of sensitizing or later on, according to the mode of preparation, and the reaction is shown by a white halo. The quantity of matter is so minute that it is generally visible only in the palest half-tones. How have these metallic particles become encrusted on the back of the paper? is now the question to be solved. We can only reply to it by an hypothesis, which, however, is such a logical one, that it will readily obtain belief.

We observe, in the first instance, that these spots generally exist before the prints are mounted upon cardboard, which at once relieves the latter from all blame in the matter. They cannot result from manipulations undertaken in the studio of the photographer himself, for all the sheets do not appear injured in the same fashion; and I have tried the papers of two different manufacturers under the same conditions, one of them always giving me spots, and the other none at all; the reason of their appearance has, therefore, nothing to do with the photographer. If we go further back, and pass to the workshop of the albumenizer, we find it impossible to accuse this worthy man either, for the side of the paper that is albumenized is rarely marked with a metallic point; this is always on the back. Moreover, the two papers which we have experimented with were albumenized at the same place, and one only of them proved to be of a spotty character; the other, coming from another manufacturer, was quite free from these imperfections. We cannot, therefore, pronounce otherwise than that the cause of the spots is to be found in the manufacture of the paper itself.

If we push our examination further, we find that these same papers, full of spots on the back, present but very rarely these faults on the face, and much more rarely, apparently, than the best papers of any other foreign manufactory, a circumstance that proves that the paper pulp is prepared with extraordinary care, and that the rags first of all are carefully selected and purified. The cause of the spots can scarcely exist, therefore, in the pulp itself. It probably arises during the period between the moment that the pulp is made into sheets and the time it is

* *Bulletin de la Société Française.*

delivered over to be albumenized. The spots, no doubt, are due to the use of the endless metallic plates that receive the pulp, or to the cylinders that dry the sheets, or those that polish them.

We believe that the last words of this research must be added by the manufacturer, who might be able to give an account of the vexing defects, either by instituting experiments, or by examining microscopically the surface of the paper, which would lead, perhaps, to a recognition of the metal that gives rise to the spots. If it is brass, it comes from the endless metallic plates; if iron, from the cylinders; and if zinc, from the pressing of the material. Or there may be contact, in a manner that I cannot explain, between the back of the paper and metallic particles detached by the frames on which the sheets are placed.

[M. Davanne exhibited to the members of the French Photographic Society some examples of the spots, very much enlarged by means of M. Van Tenac's reflectoscope, which permits of throwing upon a screen enlargements from opaque objects, such as a carte or cabinet photograph. This invention, which is certainly a very practical affair, has already been described by our Paris Correspondent.—Ed. P. N.]

EXTRACTS FROM A LETTER TO A YOUNG PHOTOGRAPHER.

BY ALEXANDER S. MACKAY.*

MY DEAR FRIEND,—According to promise, I now send you a few notes upon photographic art. You are aware that practically I have no knowledge of photography whatever, but as you have some confidence in my experience in my own business, I shall give you at random whatever occurs to me as having a bearing upon those studies you have so much at heart. I shall first of all say a few words regarding schools of thought. Sir Joshua Reynolds, in his first discourse, truly remarks, "Every seminary of learning may be said to be surrounded with an atmosphere of floating knowledge, where every mind may imbibe somewhat congenial to its own original conceptions."

Let us see then, where this atmosphere may be most freely and advantageously inhaled. To those out of the pale of art, picture galleries are fast becoming sources of art education; indeed, it is chiefly by such means that a knowledge commensurate with the growing desire for intellectual improvement can adequately be obtained. From the statistical accounts published from time to time, we see how largely those institutions are visited by the public. With a well compiled catalogue, it is astonishing how much a person may learn, in a short time, of the art of his own and other countries. It is a gentlemanly thing to be able to say something of the painters of other days, both foreign and native, as well as of the celebrities of our own time. In the most of our large cities such places of resort are to be found, and, were they generally open in the evenings, would, no doubt, be largely attended by the more respectable of the working classes. The directors of those places should see to this.

To aspiring photographers there cannot possibly be better schools for acquiring the knowledge of those principles which to a certain extent govern their own art, and as such they should be highly commended.

To the followers of your art in Glasgow, such a school exists in the Corporation Galleries there, which contain many fine works, both in portraiture and landscape. To those of you whose inclinations lie towards landscape art, I should say that the study of such works of acknowledged reputation should evoke something of a spirit of inspiration. What I have often noticed as a defect in photographic landscapes is, their want of unity. They seem to be only sections of scenes. This, I believe, in most cases cannot be

avoided, especially in subjects embracing a great extent of country. I have known landscape painters move from point to point—say a distance of thirty yards—to secure some object for the purpose of strengthening their pictures; it might be a mass of rock, or a stout old tree; this, in connection with the manoeuvring of lights and shadows, is often the means adopted for preserving the unity of their works, or, in other words, making them complete within themselves. They give abstracts of truth, rather than total truth. This the camera cannot do; but it might at least be placed in relation to objects that would be valuable as foregrounds; and to have the power of balancing a scene with an artistic eye must be an important object, and our best landscapes might be often referred to with a view to obtaining that end. Amongst the many portraits in those galleries, you must allow me to allude to one by Sir Joshua Reynolds, which every photographer should examine as often as possible; it is that of Miss Linley, the mother of R. B. Sheridan. This is the "beau ideal" of portraiture—perfect repose, superb breadth of light and shadow finely balanced, the background a darkness visible, out which looms the lovely head, composed of the most charming and luminous hues of rosette and pearl. Such a picture, to a student of a little capacity, would suggest a photograph that would scarcely be surpassed.

Let me now say, happy should be the photographers who reside in Edinburgh, and who have the privilege of breathing the atmosphere of our National Gallery. We have here a collection of portraits by all the more distinguished masters, such as seldom can be seen, from Sir Anthony Vandyke down to Sir John Watson Gordon, embracing a period of two hundred years. All the approved maxims of art in relation to portraiture are here expressed, from the broadest generalization of effect to that of the most infinitesimal and painstaking detail.

I had occasion, in a former communication, to refer to several of these productions, which, let me say, cannot be studied too intently. Let me call your attention to two or three I formerly omitted. I would have you to look at the portrait of the late Thomas Duncan, R.S.A., painted by himself, which is perhaps the finest of all this painter's portraits (and he painted many very fine ones), as an embodiment of artistic power. This work has few equals, and it is remarkable for the absence of all meretricious colouring; the round, well-developed head floats in an atmosphere of sober browns and greys; in neutrality of tone, indeed, it is not unlike a deep, rich, brilliant photograph, and may be looked at again and again with invigorating effect. Let me mention here that simplicity of arrangement and quietness of colour are unfailing sources of grandeur in this branch of art. Let us look at the whole length of Sir John Watson Gordon, by John Graham Gilbert. Here the *tout ensemble* is complete. How firmly the late President stands! How calm and dignified the expression of the head, which is admirably like the man! How powerful, yet subdued, the colouring! And all characterised by the most powerful finish. It has been remarked by eminent artists that there are few finer portraits, if any, in Europe. I shall only now allude to the characteristic half-length of the late Lord Murray, by Sir J. W. Gordon, which I also wish you to look at. Did space permit, I could point out many other noble works; but my object in this letter is to send you there to see for yourself, as to a school, where, by a little diligent attention, you cannot fail to be vastly benefited.

In the annual exhibitions of the Glasgow Institute of the Fine Arts, and the Royal Scottish Academy, are to be seen the best works of the present generation of painters; and you would act wisely in paying them occasional visits for the purpose of elevating your taste. In addition to the sources of education above referred to, I may state that there is a growing desire on the part of populous communities to have annual exhibitions of their own, consisting of paintings, sculpture, architecture, articles of

* Read before the Edinburgh Photographic Society.

vertu, and, in some cases, articles of manufacture. To those exhibitions our best artists are invited to contribute. Country noblemen and gentlemen are always willing to take an active part in such movements, and often send a few of their choicest pictures to give tone and character to the display. Let me instance the exhibition recently opened in the Smith Institute in Stirling, which was highly interesting, as being one of what is intended as a series of annual exhibitions. Here, apart from the works sent direct by Scotch and English artists, there were many lent by such gentlemen as Sir W. S. Maxwell, Bart., of Keir; Mr. Wilson, of Banknock; Col. Wilson, of Banknockburn, and many others, who have valuable collections, all of a deeply interesting and instructive nature. The enterprising town of Kirkcaldy, too, has already had two consecutive exhibitions of, highly respectable ability. Inverness and Aberdeen have likewise been bringing together the *chefs-d'œuvre* of their respective counties, I understand, with very great success. Now, in each of those exhibitions there must have been a good few pictures by the first masters, especially in portraiture. There are very few of our old baronial residences that do not contain many very fine family portraits. Raeburns there must be in abundance, as well as many by Jamieson, Reynolds, and even a Vandyke may occasionally be found. Now, what I would wish to impress upon a photographer is the fact that the contemplation and study of such works, if he be at all a susceptible being, would tend to form a basis of good taste. Here are the works of men who have devoted many laborious years to their art, who have travelled through many lands for the purpose of becoming familiar with the masterpieces of other times, and who have not only caught their spirit, but in some instances have snatched a grace beyond them. It is good to have such pictures floating, as it were, in the mind's eye, that, in posing sitters, some regard may be had to pictorial effect. In none of these works will you find anything approaching to whiteness in the backgrounds; these are generally transparent masses, of moderate depth, with the heads rising softly out of them. It is a fallacy to suppose that relief can be obtained by striking contrasts: delicate gradations, melting into the deeper shadows, will alone give it. By all means, then, avoid blackness and whiteness, or that feeling of solaris action, which too many photographs have, and which are utter abominations to all who are not either perversely blind or obstinately stupid.

(To be continued.)

THE PROGRESSIVE RESULTS OF THE PAST SESSION.

BY JOHN NICOL, F.R.S.*

THE photographic annals of 1874 are not difficult to write. The year has not been marked by great advance in any department; no wonderful improvement has been made, either in apparatus or manipulation; and hardly even has there been set up a claim for the introduction of a new process. Although, however, nothing very striking has occurred, there has undoubtedly been a continuous, steady progress. "Upwards and onwards!" has been the motto which the whole body of workers have had before them, and the result is, a more general diffusion of the knowledge of the theory and practice of the art, and more general production of high-class work. In fact, there is nothing in which the progress is so visible as in the improvement which has taken place in the pictures produced by even the best photographers—a progress of the right kind, as, after all, the picture is the ultimate object, and the object to which all our operations tend. This desirable object is being brought about mainly, I believe, in consequence of the fact that photographers are year by year putting less dependence on tools and material, and trusting more to the mind that uses them.

* Read before the Edinburgh Photographic Society.

Although, however, there have been no particularly striking discoveries or improvements made, experimenters have not been altogether idle, and there are a few items of sufficient interest to profitably occupy our attention for a few minutes. Photography is largely indebted to photographic societies for its present position, and therefore I think the London Photographic Society may fairly be allowed first to claim our attention. During the early part of the year it passed through a severe ordeal, and was as nearly as possible stamped out of existence, not by enemies, but by those on both sides who loved it well. There was no doubt faults on both sides, as there generally is in all serious disputes, and it is a matter of congratulation that the breach has been healed, and that all seem now willing to work harmoniously for the general good. The Society has done good work in the past, and I hope it will have a prosperous and profitable future. I cannot help thinking, however, that a mistake has been made in seeking, by altering the title, to extend its influence beyond its fairly legitimate sphere. The merely calling it "The British Photographic Society" will not help much to make it what the name implies, while it may retard for a time the action of those who are anxious to see the formation of a really national association—an institution free from local association or influence, without connection with any existing society, but supported by the members of all. I trust the members of the parent, to which all her true children have a filial love, will reconsider this matter, and have no doubt that they will come to see that, in the great city in which they dwell, they have a wide enough field for their operations, and that they will be ready to give their surplus energy in aid of the formation of a really national photographic association.

Collodion-bromide seems to have passed from the domain of discussion, and taken its place amongst the recognised reliable processes. It has, however, during the year, mainly through the experiments of Mr. Bolton, been vastly improved. Some time in January he published a method by which an emulsion free from any soluble salt could be made, and which simply required to be poured on the plate, and dried, to be ready for the camera. Subsequently Captain Fox suggested the addition of oleate of silver, and the process, thus improved, is, in my opinion, the most valuable addition to our knowledge that has been made during the session.

Dr. Draper, I think in 1872, showed us that we were mistaken in supposing that actinism was confined to the violet or blue ray, and during the past year Dr. Vogel has tried to show the conditions under which any of the rays might be made to act on a sensitive film. He found that when the film was stained with (say) a green, that the ray complementary to that, the red of the spectrum, impressed itself; and so in like manner with the other colours. This, like most new things, met with considerable opposition from various quarters, and both Dr. Monckhoven and Mr. Spiller wrote strongly against it, mainly on the always insufficient ground that they could not reproduce the effect. One at least of these clever experimenters has changed his opinion, and I think we have sufficient evidence to warrant the belief that there is something in it. If so, I have no doubt that the discovery is likely to lead to a method of combining colour with our films in such a way as to revolutionise our ideas of reproducing coloured objects.

Printing has, as usual, received considerable attention. Carbon continues to make steady progress, and prints by various methods are being daily produced, quite equal to anything that can be produced by silver printing. Considerable discussion has taken place as to the best means of removing the hypo from the paper, but the end of the matter is, in my opinion, that plenty of washing is the only safe and certain remedy for fading, the mischievous teaching of Mr. Dunmore, in the *British Journal* of Dec. 25th, to the contrary, notwithstanding.

Early in the year there was published a process by M

Willis, Jun., for the production of prints in reduced platinum, a process which would, I believe, give perfectly permanent results. The process is based on the fact that salts of platinum are reduced by oxalate of iron, and is as simple as ordinary silver printing. Why it has not attracted more attention I cannot understand, and am certain it only needs a trial to show its value.

In calling attention to a method of reproducing negatives by what is known as the dusting-on process, Herr Obernetter has earned the gratitude of all photographers, and its application, in the productions of backgrounds, or for composition printing, suggested by Mr. Werge, is likely to be extremely useful. Photographers are, however, a conservative race, and it may be some time before the process comes into general use; but I have no doubt that by-and-bye no good or valuable negatives will ever be risked in the printing-frame, but only used to make what may be fairly called an "Obernetter duplicate."

Gelatine has not taken the place that it was expected to do. Several operators succeeded in getting with it both fine and rapid results, but the emulsions were uncertain, and subject to rapid variation. To obviate this, Mr. Kennett hit on the idea of drying it into a pellicle, which needed only to be dissolved in water to be ready for use, and was foolish enough to carry the idea to the Patent Office, hoping, doubtless, to make a good thing thereby. I need hardly say that I am not sorry to hear that he has been so far disappointed, as if everybody who devises some trifling improvement in manipulation or material were to tie up his little dodge with patent tape, real progress would soon come to an end. The pellicle has not taken, but is a good thing for all that, and I heartily recommend those interested in the matter to try it, assuring them that they are quite at liberty to make the pellicle for themselves, Mr. Kennett's patent notwithstanding.

This paper would hardly be complete without some notice of the work actually done as a result of processes and material. Time, however, will only permit of one single item: the publication of "Thomson's China," a bold effort successfully carried out in the production of the largest and best single work that has as yet been attempted. Most of the members of the Edinburgh Photographic Society have had an opportunity of seeing specimens of Mr. Thomson's work at the popular meeting, for which he was kind enough to give the pictures, and I am sure they rejoiced as heartily as I did when they heard that the Queen had expressed her admiration of his work by giving him a gold medal.

Little that is new in tools has been introduced. The symmetrical lenses of Ross and Co. have met with much favour. They are, no doubt, very good, but I think their popularity is more a result of their small size, and the fact that they all fit into one flange. This is, undoubtedly, a move in the right direction, and will, *ceteris paribus*, give them a preference.

The only other thing of mark is Weston's Rotary Burnisher, and it really is astonishing how almost universal the use of this has become. Notwithstanding its absurdly high price, I have hardly visited a studio, in connection with which it was not to be found; and most of you know that during the latter part of the year I have gone over a good deal of ground, and in every case the instrument was giving entire satisfaction. I have seen quite as good a surface produced in the ordinary rolling press with hot plates; but the simplicity of the burnisher, and the ease with which it can be wrought, has enabled it to almost supersede all other presses, at least for small work.

And now I must bring this resumé to a close. From what has been said, it will be evident, that although no great thing has been accomplished, the year has not been barren of good results. A quiet, steady progress has been maintained, and there is abundant evidence that our much loved art is not on the wane; nay, that it is only step by step approaching that maturity which shall be its day of

great things, and that all who either directly or indirectly lend a helping hand in carrying on the good work, have much to congratulate themselves on the present position and future prospects of photography.

NITRATE OF ALUMINA IN THE PRINTING BATH.

MR. F. M. SPENCER, writing to *Anthony's Bulletin*, speaks in very high terms of the advantages of nitrate of alumina in the printing bath; but as the alumina nitrate is not an article of commerce, we think it necessary to give his experience and formula in its manufacture. He says:—

"Dissolve pure white marble, or white chalk, in nitric acid to saturation; remove the excess of marble or chalk, whichever is used, and to the nitrate of lime thus formed add carefully of a saturated solution of alum until sulphate of lime be no longer precipitated; filter or carefully decant the supernatant fluid, and evaporate it to dryness, and you have, according to Mr. Anthony, a double nitrate of alumina and potass. It is a highly deliquescent salt of needle-like crystals, and requires a high temperature to produce crystallization in any reasonable length of time, this being the most troublesome part of the operation. It must also be kept tightly corked in glass, to keep it from deliquescence by absorption of water from the atmosphere.

To make up a printing bath, proceed as follows:—

Distilled, or ice-water	... 12 ounces
Silver nitrate	... 1 ounce
Alumina	... 1-8 to 1-4 "

"If the salts are pure, there should be no precipitate or milkiness when they are entirely dissolved. The solution will have an acid reaction, but must not be neutralized by soda, potass, or ammonia, but in the following manner:—Dissolve a stick of caustic potass (in water) about three inches in length, and add carefully of any plain silver solution until a brown oxide of silver is no longer precipitated; proceed to wash this precipitate in many changes of water, lastly distilled or ice-water, until it passes off quite clear. Add of this oxide of silver to the silver bath in excess, and agitate occasionally for an hour or so; now add of liquor ammonia, a drop at a time, until a small amount of permanent precipitate of alumina is formed. This precipitate, together with the excess or oxide of silver, must be kept in the bottle with the silver bath when not in use. By exposing the latter to the light at all times when not in use, you have a bath that is always ready for business. I would remark that the proportion of nitrate of alumina should be less for a heavy or double albumenized paper, as an excess causes the print to crack; but do not perpetrate the first blunder by using double albumenized papers. Float from one and a-half to two and a-half minutes, dry quickly, and fume as usual. Print but a shade darker than you desire the finished print, as little is lost in finishing. Redden the print before toning, as usual. Prepare a toning bath as follows:—Water, as much as required for toning once; stock gold solution, enough to tone well. Neutralize with an alum solution made by redissolving a precipitate of alum in sal soda by an excess of the soda, which should be always on hand, a pint being enough for several months. The bath should be mixed in a bottle, adding a piece of litmus to the water, then the gold, and agitate; next add of the soda-alum solution until the blue colour is entirely restored after agitation, and your toning bath is ready for immediate use. Be very careful not to over-tone, and after toning return the bath to a bottle kept for that purpose only; for you have a perpetual toning bath, that only needs to be strengthened with gold solution and neutralized as above, as needed for use from time to time. Take care to collect the precipitate that deposits between times in a separate bottle, to be redissolved in aqua regia when the quantity of the precipitate becomes large enough to pay.

"I make my stock gold by dissolving a five-dollar gold coin, or its equivalent in English or French coin if I can get it, in C. P. nitric acid one part, and C. P. muriatic acid three parts; six drachms of nitric and eighteen of the muriatic being sufficient for the above quantity, and using a gentle heat to hurry the solution. A residue of chloride of silver (alloy) will remain as a precipitate, which does no harm; evaporate to dryness, being careful to lower the heat at the last; redissolve the dry mass in a little water and again evaporate, and redissolve in thirty-two ounces of water; add, drop by drop, of a saturated solution of bicarbonate soda, until the blue-green precipitate of copper (alloy) is all thrown down; filter out the precipitates, and to the solution add—

Common salt 1 ounce
C. P. muriatic acid ½ drachm.

The benefits of this printing formula I claim to be, in part, at least, as follows:—1st. A silver bath that does not easily become disordered. 2nd. The preservation of the surface of the albumen paper, so that deep or much overprinting is avoided. 3rd. The albumen surface does not become soft or partly soluble in toning, involving little or no loss of detail. 4th. That the prints tone very easily with the minimum of gold. 5th. That the tones are deep and rich. 6th. The harmony of the several parts of the formula. 7th. Economy of materials.

"I would remark, before closing, that the fixing and washing is performed as usual, and that should the printing bath become permanently discoloured, boil it, but do not attempt to precipitate the organic matter by salts or alkalis. Remember that all forms of soda, potash, or ammonia, except nitrates, precipitate the alumina in the bath, and it will not filter out. The above formula is the result of years of experiment applied to daily practice; and for many of the ideas I am under many obligations to Mr. Anthony. It has cost me both money and hard study; but I have got my pay back in knowledge, and I am saving the cost in practice. To the profits my fellow-photographers are most welcome, if they can succeed with it."

ENAMELLED CAMEO PHOTOGRAPHS.*

THE cameo portrait is a vignetted bust stamped up from a dark ground by means of a press, and possessing a glossy surface. The most difficult part of the business is the preparation of this brilliant surface; but it is by reason of this brilliancy that the pictures are so much sought after.

The most practical way of producing the finish desired is by means of the gelatinizing process I will describe. Another plan is to create the requisite amount of polish with a solution of shellac, but this method is seldom employed. By running the prints through a hot press the same glossy appearance may be imparted to them, and a rolling press recently devised by M. Muñe fulfils the object in a simple manner. As, however, the price of the machine is rather high (about 135 marks or shillings), the usual plan of employing gelatine to render the portraits glossy will still remain popular.

The manipulations are very simple. Upon the negative is placed a suitable mask of black paper, with an oval opening of suitable size, and upon the reverse side of the negative is placed, in the usual manner, a vignetting glass, which must be much smaller than the opening of the mask. When a print has been secured, it is covered over with an oval of black paper, and the white margin of the print, which before was covered with the mask, is allowed to become deeply tinted.

The picture is then gelatinized and further put into a press to be stamped up; but before this last operation is performed, the back is moistened with a little cold water and allowed to remain for about five minutes; unless this precautionary measure is taken the card easily becomes torn or twisted.

The glazing is managed as follows:—One part gelatine is dissolved in thirteen parts of boiling water, and this solution is then passed through a piece of clean flannel. A mixture is then compounded of—

Alcohol 3 parts
Water 4 "
Gelatine solution (above) ... 1 part.

This is filtered in the same way through clean flannel, and both liquids are put away in well-corked bottles. To proceed to work, some well-cleaned and thoroughly even and perfect glass plates are selected, and these are coated with a clearly filtered normal collodion, and allowed to dry in a spot sheltered from the dust. When perfectly dry, the ordinary gelatine solution is warmed in a water oven, and a sufficient quantity to steep the photographs is put into a warmed porcelain dish. At the same time the bottle containing the "alcohol-gelatine" is put into hot water, to render it fluid and to clarify it. In very hot weather, be it known, the alcohol gelatine remains fluid, but then assumes a milky turbid character. When it has been clarified, the collodion plate is covered with the mixture, the superfluous liquid being allowed to run back into the bottle, and the plate is then put on one side for two or three minutes. Then the plate is coated again, but this time with the ordinary gelatine, and then the surface is thoroughly drained, and the plate put down upon the bench.

During this time the print itself is dipped into the gelatine solution contained in the porcelain dish, care being taken in the operation to prevent the formation of air-bubbles. After the plate has been coated a second time with gelatine, the print is taken out of its bath, laid down carefully by the bottom margin, and then gently lowered, so that the whole surface comes into contact. In this way very few bubbles indeed are formed, and are most of them forced upwards as the print is lowered, and then they may be easily removed with the thumb-nail. When, however, bubbles are formed in the middle or at the sides of the picture, their removal does not involve the least difficulty. When all the bubbles have been destroyed the picture is pressed slightly with the fingers and placed to dry.

The mounting of the pictures is done in this way. After the picture has been dried somewhat on the collodion plate—that is to say, after a period of three-quarters of an hour, or double that time—it is coated lightly with good fresh paste, and upon it is laid a card, which is also faced with the same material. The cards should be soaked in water for half-an-hour before being used, and pressed in the folds of a towel just prior to the starch being applied. The card is laid upon the print and gently pressed with the hand, and afterwards a glass plate is put upon it to press it down and keep it in contact, a stone or weight of some kind giving more pressure. In this position the card remains for some twelve to eighteen hours in order to dry spontaneously. When perfectly dry the blade of a penknife is pushed underneath the picture, and it is lifted from the glass.

The photograph should leave the glass plate very readily; if this is not the case, either the gelatine solution was too thin, or the mount and picture are not sufficiently dry.

THE IMITATION OF LACE ON SILK BY PHOTOGRAPHY.—The *Scientific American* says:—"A new and beautiful application of photography has lately appeared in England, by the aid of which any lace design can be transferred to silk, so that the latter material appears to be covered with the delicate and costly fabric. The lace to be copied is secured in a frame in contact with sensitive albumenized paper, and exposed to the light until a very deep impression is obtained. This is then fixed, and the paper, washed and dried, forms a perfect negative. Another piece of paper is then sensitized with bichromate of potash and gelatine and exposed under the negative. Inking with lithographic transfer ink follows, and the paper is placed in water and lightly rubbed with a sponge. This throws out every detail of the inked spaces, the rest remaining white or free from ink. The impression is lastly transferred to a lithographic stone, and thence printed upon the silk by the usual process."

* *Haugk's Repertorium der Practischen Photographie.*

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NEW AIMS FOR THE PHOTOGRAPHIC SOCIETY.

THE paper on the origin, aims, and achievements of the Photographic Society, with suggestions for its further development, read before the Society on Tuesday evening, by Mr. Hooper, should be interesting to all photographers, whether hitherto connected with, or concerned about the doings of, the Society, or not. The chief purport of the paper is to make a bold claim for a higher position—to demand for photography Government recognition and aid, not simply as a favour, but as a legitimate guerdon for the services the art has already rendered to the country.

Tracing the history of the Society from its origin in January, 1853, with Sir Charles Eastlake, the President of the Royal Academy, as the President also of the new Society, devoted to the youngest born of the arts, down to the present day, he finally suggested certain steps for its further development. These are, first, that a royal charter shall be obtained for the Society, that it may "thus possess the power of granting diplomas for merit;" second, that the claim of the art to Government aid in the form of a money grant and premiums should be preferred; and, third, that a system of appointing committees for the purpose of making special investigations be adopted. There can be little doubt that each of the ends proposed, so far as it is tangible and possible, is desirable. The last mentioned is in the hands of the Society to carry out at any time when it may choose, without extraneous aid. The two former propositions, we are compelled with regret to admit, are, besides being somewhat vague, at present ill-timed. The Society has scarcely yet thoroughly recovered from a state of disruption which, to say the least, did not increase its prestige in the scientific world, and any application for grants of money from public funds might possibly be met with a suggestion as to the wisdom of the Society acquiring perfect harmony within itself before asking for the control of public money.

In glancing back at the history of the past, it does seem a little surprising that no effort was made to give the Society status by obtaining a Royal Charter. It began most successfully, and for many years retained its success. In its early years it was fashionable as well as successful. Her Majesty the Queen and her Royal Consort were its patrons; Sir Charles Eastlake, Sir William Newton, and the Chief Baron of England were in succession its first three Presidents; many of the nobility were amongst its members, and men highly distinguished in science and art were on its council. Its funds were large, and all its prospects auspicious. Gradually, as photography became more essentially a branch of commerce, it became less fashionable, and the merely dilettante members of the Society fell away. Gradually, also, the Society became

impecunious, and got finally into monetary difficulties. A variety of causes tended to bring about this result. The first serious fiscal error consisted in taking permanent premises in Coventry Street, at a cost the Society was not able to maintain. That is an error not likely to be repeated; but there were a number of other sources of loss the memory of which should not be ignored, as they are still possible sources of danger. A society with small subscription, like that of the Photographic Society, may very easily get into debt. One source of loss to the Society which aided in bringing about its difficulties was the loss upon exhibitions, which in several instances amounted to nearly a hundred pounds. There is some danger even now in the same direction. The first two or three of the exhibitions revived a few years ago did not tax the funds of the Society at all, or very insignificantly; whilst the last exhibition has, we believe, cost the Society more than any of the new series of exhibitions. The soirees of the Society were a heavy item of cost, and were abandoned on that score. Mr. Hooper, we notice, practically suggests their resumption. At present, and for many years, the Society has not held any soiree, the informal re-union of members and their friends at the opening of the exhibition being specially arranged to avoid the character of the soiree proper, which would necessarily involve a larger room, extended arrangements, and increased cost. The Society on more than one occasion appointed scientific committees for investigating special subjects, and a considerable cost was incurred to the Society by their labours. In the committee proposed by Mr. Hooper, especial care must be taken to avoid a repetition of the same error. There were some other sources of loss to which we need not further advert now. Happily, under the energetic and untiring effort of Mr. Glaisher and the council who assisted him, the Society worked through its difficulties, discharged its debts, and acquired a state of honourable solvency again. But one source of regret accompanies the recollection of the effort then made, and it is one, we think, which must be felt by every member of the Society: it is, that circumstances should have arisen to compel Mr. Glaisher to retire from the presidency just at the period when the end for which he had so strenuously laboured, the absolute freedom from debt of the Society, had been accomplished, and the position of the President promised to become one of comparative comfort and honour. Should it please the members by their votes to recall him this year to office, amongst those of his old colleagues who would welcome him probably none would do so with more cordiality than the estimable and amiable gentleman who has during the provisional government of the last six months filled his office.

To return for a moment to the propositions of Mr. Hooper's paper: the first objection to the plan of obtaining a charter is that of cost. The precise amount necessary we cannot with certainty state, but we believe it would involve an expenditure of a few hundreds of pounds, which the Society does not possess; and it becomes a serious question, if it had funds in hand, whether they would be well expended in such a manner. The chief aim seems to be to enable the Society to grant honours, or, as Mr. Hooper phrases it, "diplomas." There appears to be some vagueness in Mr. Hooper's ideas on this part of the subject. The possession of a charter of incorporation would involve no such powers as those to which he refers. It would involve no power whatever to grant diplomas. Diplomas are granted by various colleges to those who have gone through a prescribed course of study, and passed a prescribed examination; but the various chartered learned societies—such as the Royal Society, the Society of Antiquaries, the Chemical Society—possess no such powers, and exercise no such functions. The members of such societies are styled fellows, and the custom has obtained of indicating a given proclivity and a certain culture by the use of the honorary letters indi-

cating such fellowship. To render such a plan admissible would render necessary some change in the constitution of the Photographic Society. At present any reputable gentleman interested in photography, but without possessing any knowledge of it, is eligible as a member of the Society; but in societies where admission involves a fellowship, some guarantee of qualification and fitness is generally imperative, and the honour would be valueless without such a condition. The granting of anything like a certificate of merit, or "diploma," could at any time only follow a course of study and due examination, and the possession of a charter is not necessary to enable the Society to adopt such a course if it see prudent.

In regard to grants of money, there can be no doubt that the Government is indebted in various ways to photography for increased efficiency and decreased cost in various departments; but it might by cynical persons be asked, what especial claim the Photographic Society had to represent photography in asking for money? Grants of money to learned societies for general purposes are not commonly made by the English Government. Assuming that the plan of appointing committees to undertake some especial branch of research for the prosecution of which money might be needed be adopted, then aid from without might not improperly be looked for, and might possibly be received through a regularly organized channel. Mr. Hooper quotes a passage in which allusion is made to the yearly grant made by the Government to the Royal Society. There is some slight misapprehension about this. There is a yearly grant of one thousand pounds made by the Government to aid science, and this is placed under the administration of the Royal Society, not for its own purposes, but for the furtherance of science in various ways. The amount is apportioned by the Royal Society to such purposes as may best promote scientific progress, and possibly if a committee of the Photographic Society could make good its claims, it might receive some share of such a fund. Money grants in any other form from Government could scarcely be hoped for. The use of premises for the meetings of the Society may very legitimately be sought. Many of the learned societies have already free quarters at Burlington House, and the Photographic Society has, we think, a good claim. The late Chief Baron, whilst president, expressed a hope at one time that he would shortly succeed in securing such a boon, but his death unhappily intervened. Mr. Glaisher, we believe, also hoped for success in a similar effort. Unfortunately, personal influence is necessary, as well as a just claim, in such matters, and at present, so far as we know, the Society lacks such influence in its representatives.

With the aim and spirit of Mr. Hooper's paper it is impossible not to sympathize warmly, and we cordially coincide with many of his remarks. The only question which arises is, whether he does not aim at too much, and at a wrong time, to secure a success.

A NEW PHOTOGRAPHIC LIGHT.

AN artificial light, new in its proposed application, which it is probable may be found useful for photographic purposes, was exhibited at the meeting of the Photographic Society on Tuesday evening last. Mr. Spiller's object had been to devise a light as rich in actinic rays as possible, involving less trouble, cost, and risk than attended the various artificial lights which had hitherto been proposed and applied in photography. The electric light and the oxyhydrogen are cumbrous and costly; incandescent magnesium is costly, and the dense fumes emitted are inconvenient; the recently proposed lamp to be supplied with nitric oxide and bisulphide of carbon is attended with risk; and some others have each specific inconveniences. The light proposed by Mr. Spiller is derived from nitrate of potash and sulphur. When nitrate of potash is submitted in a capsule or flask to the heat of a spirit flame,

somewhat beyond the point of fusion, and a succession of small pieces of sulphur introduced into the fused nitre, it bursts into a brilliant white flame of dazzling intensity, resembling or exceeding that of phosphorus in oxygen. One part of sulphur to three, or a little more, of dry salt-petre is consumed in the process. Only half the normal amount of sulphurous acid evolved in the combustion is given off in fumes, the remainder being held in the residue, and there are no solid particles given off in the fumes. The mere cost of the material is comparatively small, that of the sulphur and nitrate of potash necessary for maintaining a very intense light for ten minutes being about one halfpenny; but the wear and tear of apparatus in producing a flame of intense heat remain to be estimated. The mode of maintaining a constant light, and the best means of making it practically available in photography, must also remain matter for further experiment.

MONCKHOVEN'S NEW DEVELOPER.

DR. SCHNAUSS, of Jena, has analysed the new iron developer of Dr. Van Monckhoven, which, that gentleman states, is composed of water, glacial acetic acid, and protosulphate of iron, heated for some time to 100° Cent. Dr. Schnauss makes the following report:—

The dark brown colour of the liquid at once proved the presence of acetate of iron. The decomposition of a solution of this salt takes place, however, at a temperature of 50° Cent., with the separation of hydrated oxide of iron, and development of acetic acid fumes. The fluid filtered from the developer appears, when all oxide salts have been decomposed, no more of a light green colour, like a freshly prepared solution of iron free from oxide. It behaves differently to the latter, for when boiled again, another development of acetic acid takes place, together with a separation of oxide of iron, the latter being of a much darker kind than formerly. All this points not only to the presence of acetate of oxide of iron, but also to that of ferrous acetate. That the latter could not have been produced by the lengthened action of the glacial acetic acid upon the sulphate of iron is clear to any chemist, for the far stronger sulphuric acid will not allow itself to be separated from the ferrous oxide, the presence of a base being necessary to such a result. In a much shorter and more successful manner could the double decomposition bring about the formation of acetate of ferrous oxide, namely, either by the addition of acetate of lead, or baryta, in which case the sulphuric acid would have separated with the base as an insoluble salt, and been removed by filtration. Formulæ for preparation of acetate of iron are given in many editions of the YEAR-BOOK OF PHOTOGRAPHY.

An examination of the crystals separated from the sulphate of iron proved that no sugary sulphate nor iron ammonia compound was present. On the other hand, on heating the dry residue which remained after evaporation of a sample of the developer with caustic potash, strong evolution of ammonia took place. The presence of a compound containing nitrogen—not in the form of ammonia—was therefore proved. In seeking for this material, a large series of experiments were instituted (which I will not here describe) for the purpose of separating as well as possible all the iron from the solution without introducing at the same time foreign bodies in injurious quantities.

Of the nitrogenous bodies which might be used in a developer may be cited morphine, albumen, and gelatine. Albumen, if present, would have been separated during the process of boiling, and for this reason there was no necessity for looking for it. Moreover, alcohol added to the solution only separated sulphate of iron. No trace of morphine could be detected in the alcoholic residue. On the other hand, the aqueous solution, after oxidation and precipitation of all the iron, gave a strong reaction on

the addition of tannic acid. This produced a strong, tough, and yellowish-white precipitate, which, nevertheless, was separated in the perfectly neutral solution, so that, on the addition of a solution of tannin, it was necessary to put in either a trace of ammonia or of some mineral acid, such as hydrochloric or nitric acid. This tannin precipitate, when filtered and washed, proved, when heated with potash, to contain undoubtedly a quantity of nitrogen. It may be concluded, therefore, that glue or gelatine is contained in the developer in question. At any rate, a body is present that contains nitrogen.

HOW TO UNVARNISH NEGATIVES.

BY FRITZ HAUGK.*

It sometimes happens that a negative, after it has been finished and varnished, appears too thin or thick for printing purposes. To improve such a cliché, it is best to remove the film of varnish, in the first place, and then to treat it again with a solution of one kind or another to bring about any change in the character of the silver image that may appear desirable. The most certain and simple method of proceeding, I believe to be the following:—

The negative in question is in the first instance moistened with alcohol, by pouring this over the varnished surface two or three times, so that the latter becomes thoroughly softened, and then the negative is put into a sufficiently large bath filled with a solution of ammonia. The cliché is dipped into the liquid and lifted in and out with a hook until all signs of greasiness have disappeared from the surface. When this happens the negative is taken out of the bath altogether, and washed carefully with water.

It is then quite free from varnish, and the film may be strengthened or weakened according to circumstances.

If the film is to be intensified, then this may be done either by means of iodine, pyrogallie acid, or bichloride of mercury, as may be deemed best. To weaken the film, a cyanide of potassium solution, and one of bichloride of mercury, may be made use of. You proceed by pouring over the plate, in the first place, a weak solution of mercury (say in the proportion of one part of the mercury salt to twenty parts of water), and this is allowed to act upon the image until it has assumed a slaty grey colour. Then the plate is carefully rinsed with water several times, and a strong cyanide of potassium solution poured over it. If the cliché is not sufficiently weakened by one operation, it may be repeated a second or third time in exactly the same manner, without any fear being entertained for the image.

Correspondence.

FIXING SULPHOCYANIDE OF AMMONIUM V. HYPO.

SIR,—In confirmation of Mr. Durand's experience, in your current number, I may state that I have in my possession some prints toned and fixed with sulphocyanide of ammonium which, hung upon a damp wall, and constantly exposed to light, are unchanged after twelve years of existence; whereas other prints, fixed with hypo at the same period as the above, have been (of course incurably) afflicted with the jaundice within a year after their removal from the washing trough.

I ought, however, to add, that after (for an amateur) a considerable experience of sulphocyanide of ammonium, I cannot claim *invariable* success from its use, and I have even known—out of a batch of prints toned and fixed in this way quite equally—that some appear indestructible after years' wear and tear, while others in a short time have

fallen into "the sere and yellow leaf," young in years, but old in affliction!—I am, sir, your obedient servant,
Cornhill, 8th January. H. J. C. ANDREW.

SECRET PROCESSES.

SIR,—As the question of secret processes is now before your readers, I would like to make a few remarks on the subject.

I would suggest to the profession and to amateurs, before entertaining any secret process that may be advertised, to refer back to the journals, and see what has been said by correspondants on the subject that has been advertised as a new and secret process, and give what has been stated a fair trial before buying a secret process; and if, after a fair trial, they fail, I would then recommend them to apply to the process-monger, and if, after paying the fee, they find out that it has been published before, let them be contented.

I have heard more than one person complain that a process sold as new for making enlargements turned out to be almost as old as the original collodio-albumen process itself, and they felt annoyed that they had paid a large sum for what had been published years before. This was no fault of the vendor. They should have looked into matters, and given what had been published a fair trial before they had parted with their money. The vendor in question seems to have been the first to apply the slightly modified collodio-albumen process to the purpose of making transparencies for enlarged negatives; at least, he seems to have been the first to exhibit pictures done by that method. Although the modified collodio-albumen process had been used for the purpose of making transparencies for other purposes years before, it does not seem to have been applied for the purpose of enlargements until brought out by the gentleman referred to for that purpose as a secret process.

As the treatment of the nitrate bath is now likely to engage the attention of photographers, I would like to invite all those who feel disposed (and I believe there are many of that class) to give their experience on the best method of preventing stains and pinholes in the negative, without boiling or sunning, as to avoid these appears to be a point that Mr. Edwards, in his recent announcement, seems to wish to be avoided. In that I agree with him, for I believe that boiling or sunning a bath is only temporarily beneficial, as it is never certain in its working after. I am one of those lucky fellows who have not been troubled with stains or pinholes in their negatives for many years.

Mr. Bingham told me—I think as far back as 1857—how to avoid stains and pinholes, and I have never been troubled with them since. There is nothing new in the method, for it has been published over and over again. No boiling or sunning is required. I am almost ashamed to state the method again, for, as I have said, it has been so often published. However, as I have invited others to give their experience in avoiding stains and pinholes in the negatives, I will give mine. We will suppose a bath has been made with silver and distilled water, and no other addition, and a plate coated with the usual collodion, placed in the bath for a few hours, filtered, then another plate coated, and a picture tried in the camera: as a rule, it will work well, but if it should be a little misty, one drop of nitric acid to twenty ounces of the bath will put all right. If there be about forty ounces of the bath, from fifty to a hundred plates may be worked in it before anything is done to it. After that quantity of plates has been dipped into it, it should be measured, and what is short in quantity of the forty ounces should be made up with distilled water. This will cause it to look milky, and it should be filtered out, and as much silver added as will make the bath the strength it was at first. It will then again be in the very best condition possible. As it is worked from time to time, repeat the same methods as before, and the bath will always be in the best of order, and never give stains or pinholes.

* *Photographische Correspondenz.*

Those using this method will never require to buy a secret process. It will be seen that I am not speaking from a few weeks' experience, but from eighteen to twenty years, and the method has never failed.—I am, sir, yours respectfully,
 GEORGE WILLIS.

DEAR SIR,—I do not often trouble you with a letter, but I wish now to endorse Mr. Edwards's suggestion in your last issue, that a small committee to report upon new processes would be a great acquisition to practical photographers, and to the busy photographer especially. It has long been a favourite idea of mine, and it has often occurred to me, how much the value of your paper would be, if you could see your way clear to give us an impartial opinion of some of the secret processes in the market, as well as the result in your own hands, of many of the recent claimants for favour of dry plate and other formulæ. What a world of useless individual experimenting would be saved by one efficient person doing the work once and for all!

Of course, you would have to look the fact in the face, but if your opinion were adverse, your publisher might scarcely reckon upon a full page advertisement afterwards; but for my own part, I should be glad to double my subscription to assist in averting the fearful consequences of such a calamity.

I have no objection whatever to pay for the advantage of additional knowledge, if that knowledge be actually of intrinsic worth; but that is just the point about secret processes we want to know—how much reality, and how much humbug for the money; and it is this that should be subjected to the perfectly fair and candid criticism of two, three, or four gentlemen whose names would place them above suspicion, and who would not be afraid to speak out; and amongst them I would suggest that the editors of the two journals should find a place. Funds for the purpose of experiment, &c., I think would soon be forthcoming, and I hail Mr. Edwards's suggestion as an eminently practical one, and one that, carried out, would enhance the value of the journals indefinitely.—I remain, dear sir, yours truly,
 R. W. PRESTON.

[We give insertion to Mr. Preston's very candid expression of opinion, and fully agree with him as to the advantages and comfort to purchasers to have some authoritative assurance in regard to purchases. But a little reflection must show that the responsibility involved is one that no individual ought to be expected to undertake, and which no individual could possibly satisfactorily discharge. We have said repeatedly that, in every case of which we have certain knowledge, secret processes offered for sale are processes which have, in the main, been already published, and the advantage obtained by purchase consists simply in being saved from that endless experimenting which our correspondent deprecates. The process-seller has probably undertaken that, and sells the best, or it may be a combination of two or three of them; and purchasers generally buy on seeing results. The secret process which, when purchased, may prove a boon to one photographer who reads little, and give him the highest satisfaction, will disappoint another, who exclaims: "Oh, I have seen that in the journals!" He has probably seen it, but has not tried it; or he has tried it without sufficient care and patience, and feels not only mortified that he has paid money for it, but that some one else has achieved the success which he might have had. The purchase of secret processes is very similar to the purchase of lottery tickets, and those only who are prepared for blanks as well as prizes should invest therein. We doubt very much whether committees will be found to investigate such processes, and take the responsibility of endorsing them; but it is certainly not the business of the Editor of a journal. His duty is to give the fullest information he can obtain, but certainly not to accept the responsibility of pronouncing

ex cathedra upon such matters. The loss of advertisements to which our correspondent refers on the one hand, would be a small matter to the amount of oburgation the Editor might expect if he endorsed as worthy a process with which some purchaser was unable to succeed.—Ed.]

PRODUCING ENLARGEMENTS.

SIR,—Notwithstanding the great strides made during the last few years by parties who have made photographic enlargement their study, I think it will be admitted that there is still wanting some more simple process by which small photographers who have scarcely any demand for large finished pictures might supply their sitters with pictures of a size suitable for framing. I fully admit that for those who can obtain orders for such work, it is a good (perhaps the best) plan to send it to be done to some house where they can rely upon having it well executed at a moderate price; but there are many who, like myself, only at very rare intervals receive orders for such work, but who might add considerably to their income had they the means of making themselves a good plain enlargement from a carte-de-visite negative that is much liked to (say) whole plates, or ten by eight, or, in some cases, even to cabinet size. I myself could not afford to send such work away to be done, as the probability is that if it was done as I should propose doing it (without first receiving an order), it would not then prove a remunerative proceeding; while if it could be done by the photographer himself, he would, in the event of his picture not being purchased, only lose his own time and materials.

As to the means by which this object can be attained, I am, as a reader of the News, quite aware that some assert they can produce, by means of the wet collodion process, a presentable plain enlargement. I have tried it with great care, and must say that I have not succeeded in doing so. Others are advocates of the albumen process; and here, again, I have not succeeded to my expectations, although I think I brought to the work some degree of patience and perseverance. I do not stand alone here, for I know those who paid a good price for the process when introduced, but who have thrown it on one side on account of its difficulties. I think its warmest advocates will admit that it is quite an undertaking to prepare a batch of plates, and that they do not leave their ordinary work with any great avidity to commence the task.

With the carbon process I have no experience, and should be glad if you or any one of your readers would give the details anew. Possibly Mr. Fry, who is always ready to give his experiences for the benefit of others, would be good enough to give information as to the production of carbon transparencies, as I see by the News that he is working the Lamberttype process.—I am, sir,

A PROVINCIAL PHOTOGRAPHER.

REMOVING STOP DURING EXPOSURE.

DEAR SIR,—May I ask space for a few words as regarding removing the stop during the exposure which I read in the News a short time ago, and have found it a great boon. I took a view the other day, which was rather dull here, with a rapid rectilinear lens, and gave it eight seconds', taking out the stop No. 3 at four seconds; developed, and found it exposed quite enough. I tried the view without taking out the stop, and gave sixteen seconds with the same lens, and found it under-exposed. I have also found it a great boon in taking portraits. Apologising for trespassing on your valuable space,—I am, dear sir, yours truly,

Grafton Underwood, Kettering.

C. R. P. VERNON.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.
 The usual monthly meeting of this Society was held in the Architectural Gallery, Conduit Street, on the evening of Tuesday, the

12th, Mr. J. SPILLER, F.C.S., in the chair. The minutes of a previous meeting were read and confirmed, and Mr. W. M. Ayres and Mr. J. C. Stenning duly elected as members.

The CHAIRMAN briefly called attention to the steps necessary for the election of officers. All the officers would on this occasion retire, and would all be eligible for re-election; and their names would therefore, in accordance with the rule, be printed on the balloting papers. Every member was at liberty to nominate other candidates, but their nominations must be sent in to the Secretary before that day week. Auditors and scrutineers having been duly appointed,

Mr. SPILLER asked Dr. Mann to occupy the chair for a few minutes, as he wished to exhibit to the members a new light possessing great actinic power. He proposed to call it the nitre-sulphur light. To produce this light, saltpetre was heated in a tube or capsule by means of a spirit lamp to a little beyond the point of fusion, and small pieces of sulphur then introduced. The issue was a very brilliant white flame with great actinic quality. The cost was small, as the light might be maintained for ten minutes at the cost of one halfpenny. Mr. Spiller proceeded to demonstrate and produce a light of remarkable purity and intensity. He also exhibited some fine transparencies produced in four seconds, the plate being held at a distance of one foot from the light.

A vote of thanks having been passed, and an intimation made by Dr. Mann that a slight modification of the rule relating to the certificates of members would be proposed at the annual meeting in order to correct an omission, Mr. Spiller resumed the chair, and

Mr. HOOPER read a paper on the "Origin, Aim, and Achievements of the Photographic Society, with Suggestions for its Further Development," which will appear in our next (see Leader).

The CHAIRMAN said the paper was full of suggestion. Many of the points contained in it had been discussed at different times before—the question of a charter, for instance—but as it would involve a serious cost—how much he was uncertain—

Mr. DAVENPORT: About £400.

The CHAIRMAN added, they were not rich enough to attempt it, and any resolution on the subject would be, he feared, premature. Then as to a grant of house accommodation: attempts had before been made to secure rooms in Burlington House, but, unfortunately, all the space had already been apportioned. Then as to the question of diplomas: in a profession like medicine, where health and life were entrusted to a professional man, it was necessary that the public should have such a guarantee of fitness as the diploma of a college and properly constituted body of authorities could give; but it was not customary in other professions, and he scarcely saw its applicability to photography. However, the questions were open for further consideration and discussion.

Mr. DAVENPORT corrected some errors of date in the paper. Referring to the history of the Society, he said that circumstances had changed much during the years which had passed. At the time when the Society originated, photography was essentially a science; now it was rather an industry. The Society at first was at no charge; its quarters were at the Society of Arts; it had an honorary secretary and a remunerative journal. It was not until the Society grew proud, and insisted on separating itself from the Society of Arts, that its responsibilities and difficulties began. Then began also the struggle between commerce and science, commercial men striving to ignore the scientific claims. Science had, however, done more for photography than ever photography had done for science.

The SECRETARY (Mr. Friswell) pointed out some errors in relation to photography and astronomy. The first solar eclipse in which photography took part was in 1860, when an expedition under Mr. Warren de la Rue photographed the eclipse. In relation to the eclipse to which Mr. Hooper referred as photographed by Mr. Lockyer and Col. Tennant, there was some confusion in the paper. The expedition to observe that eclipse under Mr. Lockyer, in which he himself had the honour to take part, had no photographer attached, but Lord Lindsay had voluntarily undertaken some photographic observations, and Col. Tennant, being in India, had also made some photographic observations.

Mr. BIRD said that he was afraid that photography, as photography, was out of court for Government claims. It was a compound art sciences. Mathematicians and chemists alike had combined to make it, and they received their own recognition. Whether a charter would be of sufficient value to justify the trouble and expense was, he thought, doubtful. If there were any chance of obtaining any kind of Government recognition, it would of course be desirable; but he should like to know if there were any chance before assuming the position claimed in the paper.

The CHAIRMAN said that in the British Association photography, as photography, had no definite standing, because some subjects connected with it came naturally into Section A, with physical sciences, and others into Section B, with chemical science.

Mr. WALTER NOEL HARTLEY agreed with the Chairman, and said doubtless if, in any specific investigation in which the Photographic Society were engaged, it could present a fair claim for aid, a grant would be made by the Royal Society.

The SECRETARY said that the Chemical Society had a charter of incorporation, but it had no power of granting diplomas, nor had any other similar society.

Mr. STILLMAN said that, practically, all the science in photography was in chemistry.

Mr. PEARSALL, referring to the British Association, said that many papers had been read by Mr. Claudet and others, but always in one of the sections fitted for the especial subject. He believed also that grants had been made by the Association to aid some investigations connected with photography.

Mr. HART did not think a charter would materially aid the Photographic Society.

Mr. HOOPER said he thought the time for discussing his paper had scarcely arrived. When its propositions had been more fully considered, he should be glad to have it discussed.

The proceedings then terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE third ordinary meeting of the season was held in 5, St. Andrew Square, on Wednesday evening, the 6th, the President Dr. THOMPSON, in the chair.

The minutes of the previous meeting were read and passed, and the following candidates were balloted for and unanimously admitted ordinary members:—Messrs. W. Hume, James Steele, W. Haldane, W. H. Davies, jun., Charles Robb, Richard Brown, John Weir, and A. Cormack.

Dr. JOHN NICOL read a paper on "The Progressive Results of the Past Session" (see page 27).

Mr. W. NEILSON said that Dr. Nicol was much too modest in his introductory observations: the paper was really an admirable resumé of the work of the year. He was not at all sorry that there was nothing new to record. It would be much better for the Society if members would all try and bring something good, rather than something new. He was sorry that there were many great guns who never fired a shot, just because they thought what they knew was too old. They should remember that the greatest temple was built of single bricks, and every man should contribute as many bricks as he could.

Mr. TURNBULL thought the introduction of Ross's symmetrical lens the greatest hit of the year; he should very much like, however, that a similar lens of much longer focus were introduced, as it would be of the greatest possible use, and hoped the firm would yet introduce one. The rotary burnisher no doubt did its work very well, but not better than any ordinary press with hot plate. Photographers had in their possession the means of glazing their pictures before the burnisher was introduced, if they had only taken the trouble to do it.

Mr. BASHFORD was much pleased with Dr. Nicol's paper, and should look forward to getting it printed in the journals, where it could be read at leisure. He quite agreed with Mr. Turnbull regarding the burnisher: it was a capital tool; but he had seen as good, if not better, work done by the ordinary press and hot plate. He had repeatedly tried the dusting-on process in reproducing negatives, and found it exceedingly simple; he considered it one of the greatest discoveries of the day. Not only could an exact copy of a negative be made, but a faulty negative could be vastly improved in the reproduction.

Mr. ALEXANDER MACKAY then read a paper entitled "Extracts from a Letter to a Young Photographer" (see page 26).

Mr. ROSS, in reply to the Chairman, said that he agreed with every word that Mr. Mackay had said, and especially with his observations on the advantage that a young photographer would derive from the study of art. This was no new view of his, as something like a quarter of a century ago, when the firm of Ross and Thompson engaged an apprentice, it was made a condition that he should attend as a pupil the School of Art.

Mr. W. NEILSON complimented Mr. Mackay on his very excellent paper, and thought the recommendation to study in the art exhibitions could not be over-estimated. He certainly did not like to see a white face in a photograph; but the photographer who had to live by his profession could not always get things his own way. Some of his customers preferred a face that looked

like an etching without a trace of detail, and if he refused to make it for them they would just go and employ some other body who was less scrupulous. Others of the public liked black faces, and so Rembrandts had to be taken. So long as the public was paymaster the public must be pleased, and he thought that every effort should be made to elevate the public taste, so that nothing but good work would be tolerated. He could not say that he liked the so-called Rembrandt effects generally, although he must confess that he had seen some exceedingly fine pictures of that class.

Mr. ASHER could not agree with Mr. Mackay in his estimate of the Rembrandt effects, if it applied to such as those which he (Mr. Asher) had laid on the table for the inspection of the members. They were principally of American production, and were characterised by the editor of the PHOTOGRAPHIC NEWS, in a letter an extract from which he read, as "fair examples of the legitimate use of shadows and half shadows." He would like much if Mr. Mackay or Mr. Ross would point out any defects that they might see in the specimens, and say how they might be remedied. He also took exception to the epithets "trash" and "vulgar" that had, according to the report in the journal, been applied to the effects in question at a previous meeting of the Society; and Mr. Ross explained that he used the word rubbish, and not trash (laughter).

Mr. BASHFORD said that Mr. Asher had mistaken his meaning. In his paper, read at the meeting referred to, he used the word "vulgar" in connection with the name, and not with the result itself. He could not say much in favour of some of the pictures on the table, however. The fact was that the effects were produced by a false reflected light—probably by the hand-screens introduced by Mr. Kent—and the result was the production of lights thoroughly untrue to nature. He could not agree with what had been said against retouching. Photographers' tools were not perfect, and a little retouching was often absolutely necessary to make their work as near truth as possible.

Mr. NELSON thought the pictures exhibited by Mr. Asher were very pretty, but nothing more. They were undoubtedly retouched, or so lighted that all texture was destroyed.

Mr. PANTON thought the dislike that some members had was more to the name than to the results, which, in his opinion, were very beautiful. They might not be like Rembrandt's work, but the name was selected as a matter of convenience, and any other one would have done as well. He should be very glad indeed if every member of the Society could produce work equal to that on the table.

Mr. ROSS could not understand what Mr. Bashford meant by saying that retouching was necessary because of imperfect tools. Did ever anybody hear of retouching a Daguerreotype? And yet a Daguerreotype was the perfection of photography. He was extremely glad that its re-introduction had recently been recommended in influential quarters, and hoped that the recommendation would be largely acted on.

The PRESIDENT considered the pictures on the table very fine specimens of what photography could do. Each old master had managed his light as he thought best, all arriving at magnificent results by different roads; and the same might be said of photographers. The one thing needful was the cultivation of the highest possible æsthetic education, and when that was accomplished there was no fear of the kind of work that would be turned out, no matter by what name it might be called.

Votes of thanks were given to Dr. Nicol and Mr. Mackay, and the meeting adjourned.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE first Annual General Meeting, followed by a Vocal and Instrumental Concert and Exhibition of Lantern Slides, was held on Monday last, at the Co-operative Institute, 55, Castle Street, Oxford Street, Rev. F. F. STATHAM in the chair. A large assemblage of photographers and friends were present.

A large collection of fine photographs—the prizes in the Art Union Distribution shortly to be held—was exhibited, including a portfolio of autotype prints, upwards of thirty in number, comprising the first prize; two 30 by 24 framed autotype enlargements—views on the Thames; three 18 by 24 enlargements, by Mr. B. J. Edwards; forty superb 12 by 10 landscapes, by Mr. W. Bedford; a splendid collection of statuary, by Mr. England; a copy of "Rebecca at the Well," by Mr. Blanchard, of which subject twelve copies have been given to the Association by Mr. Blanchard; the large photograph entitled "The Spring," by A. Ford Smith; and contributions from a score of other gentlemen.

After some suitable remarks from the CHAIRMAN, The SECRETARY read the report of the Board of Management as follows:—

MR. CHAIRMAN, LADIES, AND GENTLEMEN,—

In presenting this the first report of our labours on your behalf, we trust that a short account of the establishment of the Photographers' Benevolent Association will be of interest to the members and to photographers.

It is now nearly eleven years since Mr. A. H. Wall read before the South London Photographic Society a paper upon a Provident Fund for photographers, in which he urged upon the profession the desirability of it, and the benefits accruing from such fund; and, to judge from the published report, the meeting was unanimous in the opinion that such an Association should be formed; but after a correspondence in our usual place (viz., the journals) the subject dropped. Since that time it has cropped up again at various periods, being forced upon the attention of the profession by the record of details connected with the sufferings of brethren in distress. Each time, after correspondence containing suggestion as to what other people ought to do in the matter, the subject dropped. In 1868, during the usual discussion, a well-known gentleman (Mr. Matthew Whiting) made some excellent remarks, and offered the sum of £50 if started within six months. Other sums of money were promised from various parts of the country, but still there was nothing done. As usual, the correspondence bristled with suggestions as to what others must do, but every one was afraid to take the initiative, and again the matter dropped. In the spring of 1873 the matter was again broached, and, entirely upon his own responsibility (and without any plan cut and dried), the present secretary called a meeting at his house in Brixton, which was attended by about thirty assistants. Money was subscribed for preliminary expenses, and a provisional committee formed, to consider the form the Association should take, and to call a large meeting at some place in London. An aggregate meeting was held at the Arundel Hall, which was largely attended. The Provisional Committee submitted two schemes for consideration, one based upon the Foresters' Benefit Society, the other the form now adopted. After an animated discussion, the constitution we have the honour to represent was adopted. The Provisional Committee was enlarged, and power given to add to their number. Since that meeting the Board of Management has been formed, and working harmoniously together, to establish the Photographers' Benevolent Association upon a secure basis.

The earlier meetings of the Board of Management were held at the residences of the various members; then Mr. Ganly (late deputy chairman) gave the use of his sitting room at 174, Fleet Street. When he left, arrangements were made to meet there regularly, at the rent of 5s. per night.

Hypercritics may be disposed to sneer at the expenditure in comparison to the receipts; but let it be borne in mind that the expenses would not have been larger if the income had reached ten times its present amount. The Board of Management takes to itself great credit that the Association has been established for a sum of money that will bear comparison with the cost of establishing any such association.

To photographers and assistants the credit of the income belongs, and as the Association is now established, it ought to be the pride of the profession to see that the income is always large. The pride of the Board of Management will be to keep down the expenses as regards the working; but there will be desire to meet any applications for relief in time of distress.

The Board of Management have only had one application for relief, which, after due investigation, was awarded £5. Amongst other benefits accruing from membership, that of the Employment Register will, it is expected, ultimately be a very useful feature.

In conclusion, the Board of Management appeal to photographers to help them in their labours—employers, by sending donations, and using their influence in inducing their employes to join; assistants (male and female), are urged to join the Association, and help to make the Photographers' Benevolent Association thoroughly representative of the important profession.

Signed on behalf of the Board of Management,
W. T. WILKINSON.

Balance Sheet.

Donations	£49 10 8	Printing, stationery, &c. £27 1 5½
Members' subscriptions ...	14 19 0	Relief to applicant ... 5 0 0
		Cash in hand ... 3 14 8½
		In London and County Bank 28 13 6
	£64 9 8	£64 9 8

The Report and Balance Sheet (subject to the audit) were then received and accepted.

The election of officers was then proceeded with, and the whole of the old officers were re-elected, with the addition of Mr. J. Skinner as Deputy-Chairman, and Mr. Tench added to the Board.

The concert followed, under the superintendence of Mr. E. Cocking, aided by Miss Ward, Mr. and Master Attwood Bridge, Miss Hardsey, and others.

Mr. F. York, who had kindly brought a double lantern and the lime light, assisted by Mr. Oakley, Mr. Ferneley, and others, then exhibited a magnificent collection of lantern transparencies, including some presented by the Woodbury Printing Company.

During the intervals, there was a large stereoscope of transparencies, lit by a patent parabolic reading and microscopic lamp, two large graphoscopes, and two pocket cameras, lent for exhibition by Mr. Tench, 153, Fleet Street; a polariscope, lent by Mr. Huggon and Mr. H. J. Burton; and numerous other objects were exhibited.

After some votes of thanks, the proceedings terminated.

Talk in the Studio.

OBITUARY.—We announce, with much regret, the death of a gentleman whose name is well known as long and honourably associated with the commerce of photography. Mr. John Atkinson, of Liverpool, died on the 9th instant after a long illness, in the 73rd year of his age, and was buried at Smith-down Road Cemetery on the 13th instant.

TRANSIT OF VENUS.—We learn from Mr. York, that his friend Mr. Bruton, at the Cape of Good Hope, succeeded in taking a series of photographs of the Transit, which the Astronomer-Royal at the Cape has pronounced a great success.

THE PHOTOGRAPHER'S POCKET ALMANAC.—We have again received Mr. D. H. Cussons' useful little pocket almanac for photographers. It contains two Autotype illustrations, and much interesting matter.

FORMULÆ FOR TONING.—Messrs. Trapp and Munch send us some samples of albumenized paper, and adopt the excellent plan of issuing printed instructions for the best mode of using it.

PHOTOGRAPHS OF OLD PAINTINGS.—The *Times*, in a recent review of some photographic copies of paintings by old masters, says:—"A photograph from an old master is at best a melancholy production, and though these have been taken with all care and pains, they have not, of course, succeeded in overcoming the shortcomings of their art. But to have been photographed even with the comparative success achieved, these old Italian paintings must be in marvellous condition. Our own Reynolds's and Wilkie's cannot stand the fire of the camera half so well as Fra Filippo Lippi's 'Coronation of the Virgin,' painted 400 years and more ago. It is another matter when we come to photographs from the engravings of famous pictures in 'Old Masters' (Sampson Low and Co.). Here photography finds its legitimate sphere, and can give us perfect fac-similes of the finest specimens of the art and of the engraver, and a far juster representation of the original picture than when applied at first hand. We do not deny that even a blurred photograph of the actual picture possesses a charm and a reality in the eyes of the lover of art, who will scan it with an enthusiasm which he cannot feel for the copy of a copy. But for ordinary purposes, and as separate works with an intrinsic beauty of their own, these fine photographs of rare engravings are to be preferred to attempts to reproduce the actual picture."

To Correspondents.

D. L.—There are two or three ways of obtaining comparatively soft prints from hard negatives. One plan consists in slightly sunning the paper before placing it under the negative. This, whilst it does not of course give genuine gradation, by removing the harshness of the contrasts gives a certain factitious softness which often satisfies the eye. Another plan consists in removing the free nitrate of silver from the paper as soon as it is sensitized, by the use of clean blotting-paper. This will materially reduce the contrast in the print, and allow detail to be brought out in the densest lights, without burying all the detail in the shadows

W. W.—As the squeegee only comes into contact with the back of the print in enamelling, we do not think there is serious danger of using vulcanized india-rubber for the purpose; but, as a matter of absolute certainty, we think it would be wise to procure a piece of pure india-rubber; or a piece of gutta-percha might answer. It would not be difficult to make a squeegee of pure india-rubber. Thin sheet india-rubber can be obtained, and cemented to anything to give rigidity by means of india-rubber cement made by dissolving india-rubber in chloroform or in bisulphide of carbon. 2. Nitrate of ammonia is more deliquescent than nitrate of silver, and its presence in a printing bath would prevent the paper acquiring a horny dryness. 3. The proper strength of a nitrate bath must depend on the salting of the paper. Most of the commercial samples of albumenized paper in the market are made with a view to use with silver baths of from thirty to forty grains strength. For a paper prepared with (say) six grains of chloride of sodium in each ounce of albumen, a thirty-grain silver bath would be sufficient, whereas if twenty grains of salt were used, a silver bath of one hundred grains would not be in excess. As regards the proportion of other nitrates no rule can be laid down. The precise part they play is not certain; but it is found in practice that they are beneficial. We should not think it necessary to increase the proportion of nitrate of ammonia when the strength in silver is increased. 4. We have had no personal experience with the hydrate of chloral added to the pyrocollodion solution. Hydrate of chloral is a solid body. 5. We see no danger of an explosion from its use. 6. Nitrate of soda is less deliquescent than nitrate of ammonia. To determine which is best for addition to the nitrate bath, comparative experiment would be necessary, which we have never made. 7. Most stationers will be able to supply, or procure for you, Whatman's drawing paper. If you have any difficulty, Mr. Newman, of Soho Square, will supply it. 8. If you read carefully you will see that one and a-half grain of the quantity of bromide of ammonium is to be dissolved in a drachm of alcohol and added to each ounce of ordinary bromo-iodized collodion. You will not easily dissolve the quantity in less alcohol, but if you can dissolve it in less you may do so.

IGNORAMUS.—The simplest method of throwing down the silver from an old bath is by means of zinc, as we have often described. The ice-water referred to is simply melted ice. We do not recommend it in place of distilled water. There are various methods of producing photographs on ivory. The best is by the carbon process.

H. VORLEY.—Until you have become accustomed to the practice, it is not convenient to use an eye-piece for focussing. In our own case we much prefer to focus by the unaided eye, and we find no difficulty in getting perfect sharpness. There is no mode of securing the right focus of the eye-piece except screwing it out or in to suit your eye.

H. S.—You do not state what kind of direct copies you refer to. As a rule, the triple is a capital copying lens. A portrait lens well stopped also answers well.

R. G. M.—We cannot with propriety express an opinion on the subject.

2. The Osmometer collodio-chloride paper has, in our hands, given great brilliancy.

G. M. F.—Unluckily allowing the plate to remain in the bath longer will often increase the sensitiveness of the plate, and thus increase the risk of fog. The presence of iodide and bromide, not converted into salts of silver, will tend to keep the shadows clear, but will also militate against sensitiveness. This is a subject which, in relation to wet plates especially, has received too little attention.

W. W.—Formic acid does not act as a restrainer; it is said rather to have a softening tendency. In the formula you name you may use an ounce of acetic acid. 2. It is always better when trying a formula to try it as stated, and not with some modification. In the formula you mention it is not intended that the calotype of gold should be previously neutralized.

R. D.—It is not safe to print from a wet collodion negative without previously varnishing it. Many dry plates may be used without varnishing, e.g. dichroaluminon, for instance. It is possible, however, with great care, to obtain a print from an unvarnished negative without varnishing it.

C. R.—The yellow spots are undoubtedly the result of the so-called "gold" printing on the back. Some of the bronze powders used in such printing contain sulphide of tin. It is surely very unwise to use such cards after being duly warned.

D. WINSTANLEY.—Received. Many thanks.

COPYRIGHT.—The law does not require the word "copyright," or imitation of any kind, to be placed on photographs which are protected by legislation.

ERRATA.—In Mr. Walker's article on page 89 of the *Year-Book of Photography*, line 21 from top, third word from end of line, for "or" read "and."

Several Correspondents in our next.

The Photographic News, January 22, 1875.**PHOTOGRAPHY IN AND OUT OF THE STUDIO.**

ENGINEERING PROBLEMS SOLVED BY THE AID OF PHOTOGRAPHY—PHOTOGRAPHY IN PERIODICAL LITERATURE—THE KING OF SIAM'S INVITATION—PRINTING ON FABRICS.

Engineering Problems Solved by Photography.—There is one useful application of photography to which little attention has been called, notwithstanding the important employment that has been made of the art in this specific direction. It is the aid it gives to engineers and constructors to which we allude, an assistance that could not be afforded so well and thoroughly by any other means. Two instances have recently come under our notice which will demonstrate how greatly the camera may assist in the carrying out of great works of an engineering character. In India, recently, at one of the cities in the interior, it became necessary to transport a solid block of metal, weighing something like a hundred tons, from one part of the town to another, and the question how best to do it very naturally arose. One could scarcely construct a carriage for it, neither would it have been an easy matter to place such an enormous mass upon a vehicle of any description. Advice was sought for in England; and as the movement of enormous masses by our engineers at home is not of unfrequent occurrence, the authorities in this country, at the first opportunity they had, caused a series of photographs to be taken, showing the removal of a big mass of iron from the foundry. One picture showed the manner in which first one side, and then the other, of the enormous casting was raised, and a platform placed underneath; a second photograph demonstrated how two bars of iron, turned up at each end, had been put beneath to form a sort of sledge; and another print further demonstrated how rollers were afterwards thrust under this sledge, and the big structure thus moved slowly and surely along. The advantage of such a series of photographs as this, with the men all at their stations, furnished with crowbars, jacks, and other necessities, must be obvious to all; and those knowing something of practical engineering could not fail to profit by the experiences here afforded. No drawings, however accurate, or description, however precise, could have instructed so readily and perfectly as these simple pictures, which gave but little less information than a sight of the actual occurrence before one's eyes would have furnished. The sketches were not tracings or drawings of what might possibly answer the purpose, but of what had been found really to be practical. Not a rope was omitted, not a roller forgotten, and everything was shown in proper proportion and proper scale. To an experienced eye, the whereabouts of the greatest strain was at once apparent, and the reason for the various precautionary measures perfectly evident. The other incident to which we refer is of a similar kind. The screwing of iron piles into a river bed, especially when the former are of large proportions, and there is much tidal variation, is a matter of peculiar difficulty, and the rigging up of crab and capstan, arrangement of the rope and tackle, necessitate some considerable experience on the part of the engineer. This being so, it has been decided, in the case of an iron pier which is now being constructed in London, to take a set of large photographs as the work progresses, showing the whole manner of working from first to last, so that in future operations of the kind, a foreman or manager provided with copies of the pictures may not meet with any difficulty in undertaking the work, nor lose time in trying one system or the other, before settling upon a trustworthy plan. It is in fulfilling functions of this kind that photography will be invaluable to the engineer, and in the course of any future undertakings of importance we may rest assured that every step of the structure towards completion will be accurately delineated.

Were we in possession, for instance, of photographs showing the Menai Bridge in course of construction, or other similar great works, such would be not only exceedingly useful for the instruction of youthful engineers and pupils, but they would be, moreover, most valuable aids in the completion of other works of a similar nature.

Photography in Periodical Literature.—A little while ago we called attention to the use made in America, and especially by the *New York Daily Graphic*, of photography in reproducing MSS. and sketches, and dwelt upon the fact that although much has been done in this country to work out photo-mechanical processes, very little advantage had been taken of these in Great Britain by our periodicals. A great change has now taken place during the brief interval that has transpired, and, instead of having but one journal—the *Figaro* programme—which photography aids in illustrating, we have three weekly papers now appearing regularly with photo-relief prints, and one in which a kind of photo-lithography is largely employed—a comic journal called *Funny Folks*. In the latter case a very perfect process appears to be used, judging by the results we have seen, for the foreign cuts and lithographs reproduced might very well be confounded with the originals. It may be termed a photo-zinco-lithographic method, for we are told that after the image is taken it is first put upon zinc and afterwards on stone. Now that collotype printing is also steadily progressing, we may hope to see further ventures made by publishers, for as yet there is one great branch of the art untouched—the vulgarization of photographic views and landscapes. Some pictures we have seen of Rhine scenery produced by the last named process were so excellent as to lead us to the belief that in a very short space of time we shall have illustrated journals containing little else than landscapes produced from first to last by the photographer. But for these great applications of the art to industrial purposes, disciples of the camera need not despair, for, let pictures be sown as broadcast as you will, good photographs will always be sought after and well paid for. Neither the landscape photographer nor the portraitist need be under any apprehension of their work being cheapened by the multiplication of views and portraits that is becoming every day more extensive, for, however much the mechanical departments of the art may be simplified, chemical and artistic knowledge on the part of a photographer must always command a position.

The King of Siam's Invitation.—We are very glad to hear of the invitation sent to our scientific men by his Majesty the King of Siam to witness the approaching eclipse of the sun in his dominions. The invitation has been made so politely, and with such liberality, that if it has been extended to other European nations besides ourselves, there is a probability of the hospitality of his Majesty being severely taxed. Both the Royal and Astronomical Societies have been asked to send deputations to witness the phenomenon, and these two bodies have resolved to send some half-dozen gentlemen at least. The wording of the King's letter is especially gracious, for not only will it give him pleasure to erect one or more observatories in any portion of his dominions for the temporary use of his guests, but he further states that the whole staff that comes over will be treated as private friends of his own. It proves something for the Siamese nation that they have such a respect for the votaries of science.

Printing on Fabrics.—In the 1873 exhibition of the Photographic Society, it will be remembered by many of our readers, there was a charming imitation of black lace upon a white parasol. A very fine and expensive bit of real lace had been photographed, and as the result was merely a black and white image, no difficulty was experienced in converting it into a mechanical printing block. In this case a gelatine film was employed, and either the Lichtdruck or Albortype process, so that the image was

preserved in all its delicacy, and every fibre of the lace shown with extreme sharpness. So perfect was the result, indeed, that, unless one touched the parasol, it was impossible to believe that the lace was not actually a tangible reality. The same process is now being further employed for printing upon handkerchiefs and shirts; and we were fortunate in seeing the other day some more examples of what can be done in this delicate fancy printing process. Some handkerchiefs shown us had at the corner two or three butterflies most charmingly impressed, the images having evidently been taken direct from the insects themselves. Other fabrics had sketches, evidently reproductions from woodcuts and engravings, obtained and printed by a photo-mechanical process, all of them being of a most delicate nature, such as could hardly be secured from blocks on lithographic stones. Photographic portraits of various kinds were also to be seen impressed upon fabrics in the same way; but these, perhaps, can scarcely be called novelties, neither was the result so successful as in the case of the other objects we have mentioned. The prints were undoubtedly all produced by fatty ink, and would, no doubt, be very permanently printed upon the fabric. This method is much simpler and satisfactory than printing in the ordinary way by means of silver salts, for very great care has to be exercised in the latter case, and failures are far from unfrequent, the dressing in the fabric being most difficult to remove and apt to discolour the silver print. Moreover, there are the troublesome operations of salting and albumenizing, and flattening the stuff, which is by no means an easy proceeding any more than the examination of the print in the pressure-frame. This photo-mechanical printing upon fabrics is certainly an art to be cultivated.

THE ORIGIN, AIM, AND ACHIEVEMENTS OF THE PHOTOGRAPHIC SOCIETY, WITH SUGGESTIONS AS TO ITS FUTURE DEVELOPMENT.

BY GEORGE HOOPER.*

THE Photographic Society was founded on the 30th of January, 1853, the first meeting being held at the rooms of the Society of Arts, John Street, Adelphi. Its first President was Sir Charles Eastlake, P.R.A., and it had Earl Somers, Sir W. J. Newton, and Prof. C. Wheatstone, F.R.S., as Vice-Presidents; amongst the original members of the Council were Dr. Hugh Diamond, P. le Neve Foster, M.A., Robert Hunt, F.R.S., Dr. John Percy, George Shaw, and Captain Scott, R.N. Alfred Rosslyn acted as Treasurer, and Roger Fenton as Hon. Secretary.

In this paper I shall review some of its special achievements, both in encouraging art and scientific research; and after taking this retrospective glance, make suggestions of a practical nature as to the best means to be adopted to increase its usefulness, and thereby raise the status of the art generally, and necessarily those who practice the same, in the eyes of the public.

The art of photography will doubtless be handed down to all ages as one of the most important inventions of the nineteenth century.

It not only has been the means of creating a new industry, but has itself become more or less connected with every other known industry, so that whether it be religion, law, politics, manufacture, or education, it plays its part. It has, like the telegraph, brought all the world together, so that we can familiarize ourselves with the features of every race of mankind and study their habits and customs. In fact, to summarize its immense capabilities, we may say that things animate and inanimate have been represented with a truthfulness otherwise unattainable, and even things so minute as to be invisible to the natural eye can be easily photographed and enlarged to prodigious dimensions.

Science generally has benefited by photography; a love for real art has been generated, as well as a deep regard for that which is both truthful and beautiful. This can be proved by referring to many of the topics that have been so ably brought forward and discussed at the meetings of the Photographic Society. Daguerre, Fox Talbot, and Archer are three of the names that will always be inseparably connected with this fascinating art.

The Photographic Society began its career under the most flattering and encouraging circumstances. It had Royal patronage; many of the nobility figured in its rank; funds were lavishly expended, and within four years it had over one thousand pounds in funded property.

It is generally considered every thing to start well; but we have also heard it said by wise men, "That early success, unless accompanied by experience, often leads to a rapid decline;" and this was somewhat the case with this Society. It began too well, considering all experience had to be gained; and this experience almost cost the Society its life. However, thanks to the determined energy of some of its most constant and earnest friends, it survived this sudden and rapid decline, has for years been on a firm basis, and may now be said to have a good constitution.

The Photographic Society has arrived at its majority, and is this very month entering upon its twenty-second year; nevertheless, it cannot be said to be full-grown. Far from it; for there is yet an immense field of usefulness ahead, and the Photographic Society of Great Britain must take the lead in developing the varied branches of the art; it must act as pioneer, and by scientific investigations, lay before the world all that is new and interesting.

A brief review of the past proves how productive the young art was when this Society commenced in 1853. Four papers were read at the very first meeting, one being "Photography in an Artistic View, and in its Relation to the Arts," by Sir William J. Newton; another on the "Wax Paper Process," by J. Percy, M.D.; another entitled "Photography as an Aid to Engineers," by Sir C. Vignoles, C.E.; and the last, a paper "Upon the Mode it is Advisable the Society should Conduct its Labours," by Roger Fenton, Hon. Sec. At the second meeting "The Collodion Process" was under discussion; at the third and fourth meetings, technical matters; and at the fifth, Sir Charles Eastlake, the President, was able to announce that Her Majesty the Queen and H.R.H. Prince Consort had consented to become the Patrons of the Society.

Next came papers by Mr. Claudet on the "Daguerreotype Process;" by Dr. Diamond on the "Calotype Process;" and Roger Fenton on the "Nitrate Bath;" also by Mr. Wenham and George Shadbolt on "The Production of Large Prints from Small Negatives." It was at this period that John Spiller (our President) first published a formula for preparing a "Protonitrate of Iron Developer."

The Society's first exhibition of photographs was opened on the 3rd of January, 1854,* with a soirée at the Suffolk Street Gallery, the Queen and the Prince Consort taking a private view at eleven A.M. of that day. This exhibition remained open two months. We would mention here that the Journal of the Society was at this time very popular, having as its contributors many gentlemen of scientific eminence; it was sold at threepence per number to non-subscribers, and had (we believe) a circulation of between three and four thousand copies.

In January, 1855, the exhibition was held in the Gallery in Pall Mall East. The following month, Sir Charles Eastlake retired from the Presidency, and the late Lord Chief Baron (Sir Frederick Pollock) was elected to the position. In the same year a committee of seven gentle-

* Read before the Photographic Society of Great Britain.

* The first exhibition of the Photographic Society was held in the rooms of the Society of Arts at the latter end of 1853.—Ed.

men was formed to investigate "The causes of fading of positive prints." The Society voted £25 towards defraying the expenses, and the Prince Consort gave £50 for this same object. Mr. J. E. Mayall read a paper on the "Dry Collodion Process," and in September the Taupenot process was introduced. January the 3rd, 1856, the Society appointed a paid Secretary and Editor at a salary of £200 per annum; prior to this an Editor received £60 per annum, an Assistant Secretary £30, the sale of the journal realizing the Society about £100 per annum.

In February, 1857, the Society had £1,050 in hand; but the expense of changing its premises decreased this amount to the extent of £700 by December. Within two years of this time the entire funds were eaten up, and an expenditure in excess of income to the extent of £586 16s. 7d. had been made.

In May, 1857, an event worth chronicling occurred, as a proof of the good feeling that existed in the profession at this period. It was on the occasion of the death of Scott Archer, whose wife and family were left unprovided for, when the Society, led by Mr. Mayall, started a subscription which ultimately realized £747, and Sir Wm. J. Newton, addressing an earnest appeal to the late Earl Derby for a pension for the three orphans, obtained for them an annuity of £50.

At the Exhibition of 1859, carbon prints were shown as a novelty, and alkaline gold toning referred to. In the same year a "Collodion" Committee was appointed, and issued a report.

During the session of 1860-61, the Society lost its patron, the Prince Consort; but no other event of importance occurred. From the Report of the Society for this year, I extract the following sentence:—

"To the Royal Society there is yearly appointed a Government grant of money to be expended in furthering scientific investigation for the benefit of the country. The Council of the Photographic Society, pointing only to the practical results hitherto attained under unfavourable circumstances, would venture to suggest that assistance should be granted by Government towards improvements in the processes of photography. It would serve to determine many difficulties, and tend to increase advantages now derived from the various employments of art in the different departments of the Government. A yearly grant, if only a tithe of the money saved by substituting photographs for the mechanical drawings formerly made in all Ordnance, Naval, and other departments, would stimulate advancement in the art, and assuredly more than repay the expenditure."

In 1864 the carbon process of Mr. Swan was first introduced. The introduction of this process, that has since grown to such dimensions, was the occasion of a very large attendance and an animated discussion.

It is remarkable that in the address at the annual meeting of the Society for 1865, the Lord Chief Baron said, "He entertained the same zeal for the progress of photography, whether as an art or a science, as he had ever done. Although he was not so young now, nor so able, perhaps, actively to illustrate that zeal, still he was capable of rendering them some service, and he hoped to save them some expense in a place for meeting." Then came these significant words, which I am particularly anxious to draw attention to:—"It was notorious that other societies with no higher claims to the assistance of Government, were provided with rooms at Burlington House. Almost every society with any claim whatever had rooms there. He purposed going there himself next day to ascertain how far, in point of fact, accommodation could be secured for this Society; and if he found a suitable room was to be had, he would make application to the members of Government with whom the matter rested, and obtain sanction for this Society to be accommodated." In the same year Mr. Simpson introduced the useful and

beautiful collodio-chloride process, and Mr. Woodbury the photo-relief printing process.

It was at the Exhibition of 1867 that the twelve photographs lent* by the great French artist, photographer, and sculptor (M. Adam-Salomon) brought about what might be truly called a revolution in English portraiture.

The session 1868-69 was an important one. Sir Frederick Pollock retired on account of his age, being then in his 86th year, and James Glaisher, F.R.S., became President of the Society. At the annual meeting in February 1868 he made a spirited address to the members, urging them to use every effort to put the Society in a good position financially, and had the gratification of seeing this effected within a short period. I quote a sentence from the address of the President on this occasion, as it shows the important part played by photography in its immediate connexion with science:—"Who could feel the value of photography more than himself? But for photography he or his assistants would frequently be workers and watchers all night long. The records of the registration of their instruments required taking once in every two hours; and little rest was obtained under such circumstances. They had to record the variations in movements so delicate that the finest spider's web was sufficient to arrest the motion. It could only be registered by an imponderable, and that imponderable, was "Light," and the process "Photography." He could speak with much feeling and appreciation of what photography had done for science and for his own labours. They knew too that photography had a great future, and he hoped that each member would resolve to take his share in it."

At the next meeting of the Society another very interesting demonstration of the photo-relief printing process was given by Mr. Woodbury. I shall pass over the review of the last four years, considering its history is fresh in the memory of us all; suffice it to say that the Society has steadily progressed, its annual exhibitions have become increasingly popular, and its financial position good.

Having, then, taken this retrospect of the work of the Photographic Society, and traced its history, and necessarily, to a great extent, the history of the progress of the art to the present time, let us now consider the best means that can be adopted for the future development of the art we love, and the part to be taken therein by "The Photographic Society of Great Britain." To rest upon our laurels, or, with Earl Russell, "Rest and be thankful," cannot be the motto of a Society that represents so productive an art as ours; and until many things that now appear almost impossible not only become possible but practicable, we cannot afford to entertain such an idea; and it is this that has induced me to make certain suggestions the practicability of which, I trust, will be thoroughly discussed at this or some future meeting, and action taken thereon. For the sake of being explicit I shall divide my subject into three heads:—

1. The necessity of obtaining as soon as possible a Royal Charter, and thus possess the power of granting diplomas for merit.

2. Our claim upon the Government for a money grant, and suitable premises wherein to hold our meetings, exhibitions, and have permanent offices.

3. The necessity of forming committees for scientific investigation that shall annually report their results to the Society.

First, then, let us discuss "The necessity of obtaining as soon as possible a Royal Charter, and thus possess the power of granting diplomas for merit."

An attempt was made to obtain a Royal Charter some years since, but it proved unsuccessful from causes easy of explanation; this, however, is not likely to be the case

* This allusion is made in error. Mons. Adam-Salomon did not send or lend contributions. The examples of his works exhibited were some in the possession of Mr. Wharton Simpson, who lent them to this exhibition.

The Photographic News.

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THE FADING OF SILVER PRINTS.

We publish on another page an interesting letter on a question of vital importance to photographers, written by a gentleman whose skill and experience in the art give unusual weight to his observations. Captain Ross's name is associated with some of the finest pictures which have graced the walls of the photographic exhibitions, and his experience extends over a period of thirty years. In the course of that experience he has produced prints which have faded, and prints which remained permanent for upwards of twenty years; a result probably common to the labours of all old photographers. But the point of especial interest consists in the fact that he has carefully noted the causes in operation in both cases. His experience teaches no new doctrine: its value consists in the weight it gives to lessons before taught, but unfortunately too often forgotten or overlooked, namely, the vital importance which attaches to modes of washing prints to remove all traces of the fixing salt, which, if unremoved, are fatal to the stability of the print. The common mistake is to suppose that long soaking constitutes thorough washing. With every supposed appliance for thorough washing, Captain Ross has found what so many have found, that some prints faded; but he has also found that this fading was due to the failure of the appliances to effect the desired end, owing to prints sticking together in a mass, and so preventing each one from being subjected to the action of a constant change of water. We have often insisted on the importance of rapid washing in many changes of water. Where this is done, and the prints can be washed a few at a time, there is little risk, if the fixing process itself have been properly performed, of the prints fading. Where the prints in hand are few there is not much difficulty in draining each carefully and thoroughly between the rapid changes; but in establishments where the number of prints daily produced is large, this is more difficult. In such cases something more than trusting to the effect of running water is desirable. We have urged before, and we repeat the advice, because of its importance, that two or three times during the process of washing the prints should be placed in an even heap and subjected to heavy pressure, to remove as nearly as possibly every drop of moisture. The prints should then be separated and singly placed again in clean water. Such a process two or three times repeated, with final treatment in warm water, will more effectually wash a batch of prints in an hour or two than many hours soaking in water without attention to their separation, so that the whole surface of every print may be subjected to the action of fresh water untainted by the traces of hyposulphite. We strongly commend the various suggestions of Captain Ross to the attention of our readers.

OBITUARY.—O. G. REJLANDER.

A GREAT man has passed from amongst us. We have to announce with profound regret the death of the father of art photography, Mr. O. G. Rejlander, in the sixty-second year of his age. A lingering illness of many months standing terminated on Monday morning last, when he calmly fell asleep.

Of the early life of Mr. Rejlander, we have but brief record, derived from his incidental remarks in conversation. By birth a Swede, he lost his father, who was an officer in the Swedish army, early in life, and began his struggles very young. With an earnest passion for art, he early devoted himself to painting, and maintained himself whilst studying in Italy, by copying the great masters. Subsequently he came to England to devote himself to his profession as a painter, and whilst so engaged he came under the glamour of the new and marvellous art of sun-painting. He felt its rare and subtle power with an artist's instinct, and the inherent limitations of that power, and the further limitations imposed by imperfect appliances, only stimulated him to varied ingenious effort to supply the shortcomings these limitations involved.

A well written biography of Mr. Rejlander would not only be full of interest and instruction; but it would necessarily furnish most important contribution to the history of the art development of photography. Amongst the first, the ablest, and most persistent of exponents of the pictorial capacity of the new art, a quarter of a century of his life has been devoted to a practical demonstration of its claims. Chance or choice fixed his residence for many years in a district most unpromising for facility or suggestion in connection with art photography. In the town of Wolverhampton all his early works were produced. The "Two Ways of Life," the first photograph of ambitious aim in pictorial composition, although by no means the first photograph with pictorial aims produced by Mr. Rejlander, as well as others was produced here from such models as he could select from the denizens of a "black country" town. The especial object of this picture was to illustrate art capacity in photography for the Exhibition of Art Treasures at Manchester. Many photographers will remember the varied criticism which this picture evolved from both artists and photographers, criticism which as Mr. Rejlander once observed to us, contained more both of praise and blame than of real appreciation. The history of its production and the result are full of interest, and although twenty years have elapsed, and the art of combination printing has progressed greatly, the work remains a marvel of photographic skill and art excellence. In his early photographic labours, especially, the difficulties attendant upon photographic pictorial effects seemed to possess an absolute charm. The delineation of a subject like the "Head of John the Baptist on a Charger" would seem at first sight to be quite beyond the legitimate range of photography; and in later days Mr. Rejlander himself confessed that it was so; but in the enthusiasm of his first love, he believed the art of his adoption might effect anything. The picture in question was an undoubted success. A nobly modelled head with the facial muscles apparently relaxed in death, the heavy locks of hair, damp with the dews of death, resting on a charger, the ghastly effect of excision covered with a napkin. For two years, M. Rejlander once told us, he saw that head on a body walking about the streets at Wolverhampton; he never saw it without a yearning to place it in a dish as we saw it in the photograph, and he never rested until he made the acquaintance with its owner and obtained his permission to take it off. Higher and more wholesome in aim and character have been the many thousand of simpler pictures and studies which have teemed from his camera. The especial quality of his work, the most trivial as well as the most ambitious, was the presence at all times of a thought, an intention, a definite idea, in every picture. He believed in the capacity of photography. "I cannot see," he said, very early

given off by reason of the greater volatility of the chloride of potassium, a bye product in this reaction.

In conclusion I have only to state that no claim of novelty is set up for any thing beyond the photographic use of the nitre-sulphur light, the light itself having been shown as a lecture experiment certainly as far back as the year 1850, when I had the honour of officiating as Lecture-Assistant to Dr. A. W. Hofman at the Royal College of Chemistry; and I find even an earlier account of it at page 221 of Griffin's 'Chemical Recreations,' published in 1847.

EXTRACTS FROM A LETTER TO A YOUNG PHOTOGRAPHER.

BY ALEXANDER S. MACKAY.*

THERE is another matter concerning the management of portraiture that I shall take the liberty of referring to: I mean not reflected lights, which are generally so many degrees below the principal or daylight of the picture, but *all-sided lights*, which not only destroy all roundness, but invariably produce the most grotesque squints. In small cartes this was past muster with those who are not particular to a shade, but enlarge them to the size of life, and you will at once find what a miserable result you have. If at all possible, let your light always flow from one direction; I press this upon you as of much importance.

Let me say here that a most reprehensible practice in your art is that of touching negatives—I mean beyond the removal of mere specks. A portrait can only be acceptable in proportion as it represents the character of the man in the faithful rendering of his facial development; and to fritter this away, with the avowed purpose of softening or beautifying the head, is the most absurd of all absurdities. I don't think the public are at all clamorous for touched cartes; it seems to me an itching some have to make their work pretty; yes, alas! merely pretty; they don't consider the sacrifice they make. If photographs were taken under a well-disposed, one-sided light, with a befitting background, there would be no necessity found for touching; There is no reason why negatives should be very complete, and when they are not so, it must arise from the absence of a preconceived mental arrangement of the subject. Thus

"Evil is wrought by want of thought,
As well as want of heart."

I sincerely hope that henceforth we shall have as little touching as possible; we should have none of it, especially in the portraits of distinguished men: the great men whose memories the people cherish and revere, they wish to see them as they appeared in the flesh. Among the celebrated divines, for example, we have in their purity, portraits of Drs. Chalmers, Macleod, Guthrie, and Candlish, all wonderfully characteristic heads; another great name has just occurred to me, that of Hugh Miller; and I would ask, who would have dared to polish down his rugged front? To tamper with such heads would be giving the lie to our successors—it would be depriving posterity of its hereditary rights.

I desire now to direct your attention to what are called "Rembrandt portraits;" this, I am afraid, is rather a comical misnomer, in as far as they bear any resemblance to the portraits of Rembrandt; I should like to know the point of contact, or the principles on which they have been thus christened. The luminous transparency of that great master's works has been, and will continue to be, the admiration of every succeeding age: in many of his pictures there is not above ten or fifteen per cent. of positive light, but the remainder is by no means blackness, but a glowing darkness, in which the details are almost as well made out as in the more prominent parts. I had sent me recently, for enlargement, heads of a lady and gentleman in this particular manner; the heads were totally in shadow, excepting that down the off or narrow side of each there was a clear, sharp outline of light, which, in the gentleman, also struck the outline of a well pro-

nounced aquiline nose; both heads reminded me forcibly of the moon nine-tenths in eclipse, and had they been enlarged their appearance would have made both day and night hideous. Of course they were declined, and ordinary cartes substitute with marked advantage.

In the above remarks, I think you cannot fail to see my drift. I have been very frank in pointing out to you the means by which you may purify your taste. I have given you an untouched photograph of my opinion on the several matters alluded to, and, on consideration, you will just take it for what it is worth. I am very anxious that you should leave no stone unturned by which you may acquire a thorough knowledge of your business; you should lose no opportunity of becoming familiar with works of established reputation, either in early or more recent times. Books upon art are not numerous, and, after all, little else but dumb show to the uninitiated; the sight of several good pictures will appeal more eloquently to your feelings, than many volumes merely theoretical, could possibly do.

With regard to objects of photographic study, I may say a few words. With the exception of works purely historical, or those compositions that appeal more immediately to the imagination, there is scarcely anything in nature out of your province, which fact has already been amply proven. Although in the mass of subject matter at your command, there will always be a difference in degrees of excellence. Scotland is peculiarly rich in magnificent scenery. Amongst those monuments of creation, the everlasting hills, you may feast to your heart's content; in fact, the whole of the "land of mountain and flood" you may range over. In noble architecture, too, which Goethe somewhere finely calls "frozen music," there is superabundance of material. Our old castles are a never failing source of interest, and those of our own country would form rather an imposing album. Let us not forget our old baronial trees, our druidical oaks especially, with their fine sinuosity of branchification. What useful auxiliaries to the landscape painter would photographic collections of our gigantic trees be! I do not mean for servile copying or adaptation of any kind, but simply for their very suggestiveness. I have in my possession an excellent photograph of an old ash, uprooted by the severe storm of two months ago, on the estate of Robert Dundas Esq., Arniston; this tree had obtained a somewhat patriarchal age, being no less than four centuries old. In its prostrate condition it forms a very agreeable picture, however; it stands out against an immense beach, the height of which forms the principal point in the composition. This is a work by our treasurer, Mr. Pringle.

It seems to me there can be nothing more worthy of attention than magnificent ruins; the excavated remains of cities thickly peopled in times long past, they strangely kindle our emotions, probably from the fact that we associate those objects with this human feeling. To contemplate them without irrepressible awe is simply impossible. "Our fathers, where are they?" must rise to every human lip. I think also that the simple photographic tone is the best medium by which such objects can be expressed, as if being starved even of a glow of colour, adds more intensely to the feeling of the utter desolation.

The feeling I would like to express has been frequently shown in the Queen Street Hall, and at the very last meeting we had a most brilliant display, by the oxyhydrogen light, of "Egypt and the Nile," and in the exhibitions of her ruined temples we had many glimpses.

"Through the dark postern of time long elapsed."

I would now only remark to you, that truth absolute and uncompromising must ultimately prevail, and anything that bears not that sovereign stamp in all the human intelligences, will inevitably perish: truth, that small but significant word, is all powerful. The vast systems revolving all around us in the heavens are regulated in obedience to its spirit, as it is one of the principal attributes pertaining to the Deity, for he is Truth as well as Love.—Yours, &c.,

ALEXANDER S. MACKAY.

in their studios, than would be the case if the pictures were hanging on the walls of an exhibit on. The maximum time allowed to each member is four days; and as each portfolio contains about a hundred prints, the time allowed is none too much.

The institution of *wander albums* in England would, we think, be of benefit to many of our brethren in the country.

Critical Notices.

REPERTORIUM DER PRAKTISCHEN PHOTOGRAPHIC. Von FRITZ HAUGK.—(Weimar, 1875. B. F. Voigt.)

We are glad to receive so practical a hand-book as the one sent us by M. Haugk. It contains a goodly mass of information, and, what is better still, the facts are well tabulated and easy to find. M. Haugk tells us his work is suitable for the beginner, the amateur, and the professional photographer; and although the latter, if they have attentively read the photographic journals of late, will find little of novelty in the work, it will be, at any rate, a convenience to have the improvements of the last few years bound up together in a volume, to be referred to at any moment.

Many manipulative instructions have been left out as being considered unnecessary and we agree with the author in saying that those who desire initiation into the art of photography should seek instruction in the first place under a master, who will teach them in a few hours what they could never learn from a book in the matter of handling plates, dipping, working the camera, and other practical manipulations, which must be seen to be thoroughly understood.

In describing the printing processes, M. Haugk goes very fully into the matter of silver printing, and gives many important hints about mounting, pressing, and finishing, which professional photographers will thank him for. He also touches upon the collodio-chloride process, and gives the necessary directions for printing by means of that method; but, singularly enough, there is no mention of printing in pigments, which is now practised successfully in many studios; nor of the *Lichtdruck* or *Albertype* processes, which just now bid fair to be taken up extensively by portrait photographers. The beautiful specimens of portraiture that have recently been produced in Germany and England by mechanical printing makes us particularly interested in this branch of the art at the present moment, and we should have been thankful for particulars of the most improved *Lichtdruck* process as now practised.

As a laboratory companion for all ordinary purposes M. Haugk's volume, however, appears to us admirably suited, and we shall have pleasure in placing before our readers a few interesting extracts from it. The author has not forgotten to make mention of the failures that arise in practising photography, nor the cause of their origin; indeed, so much is said about them that beginners who are not very ardent in their desire to learn, might feel tempted to turn back at the outset when confronted by such a legion of obstacles. We do not think much can be learned from books in the way of correcting defects; these can only be combated successfully by experience. Indeed, a good photographer, like a good general, is only to be tested by misfortune.

One of the most useful portions of Haugk's treatise is the collection of tables at the end, in which the equivalent of millimetres and centimetres and grammes, and other French decimal measurements and weights, are given. It has now become a European custom to employ the gramme and metre; and scientific men in this country who publish their experiences in English journals alone, almost invariably turn their numbers into the French

equivalents, as being far more accurate and reliable. Photographers must, therefore, of necessity, make themselves acquainted with these measurements; and, when once learnt, they will be found more intelligible than our ounce, or fluid ounce, the value of which is always doubtful. We are glad to see one scale being gradually adopted in England, Germany, and France, and as weights and graduated glasses, marked with fractions of the gramme, and centimetre, are now to be purchased everywhere, the sooner we adopt altogether the metrical system for scientific work the better.

TINY TRAVELS. By J. ASHBY-STERRY. (London: Tinsley Brothers.)

We must confess that we feel some degree of compunction in introducing photographic readers to Mr. Ashby-Sterry's *Tiny Travels*. These travels are so full of delicious laziness, such *insouciant* abandon, such disregard of every consideration in life, except bright, easy, unfettered enjoyment, and present such a contrast to the majority of the travels undertaken by photographers, who are generally terribly in earnest in taking their pleasures, that we really feel there is some danger of demoralizing our readers, in bringing them *en rapport* with such a book, and such an author. The tiniest equipment of the photographic rambler, the merest pocket camera, walking stick tripod, and sandwich-case-like box of dry plates, cannot be assumed without meaning business. The weight and bulk of the impedimenta may be utterly unimportant, but the amount of pre-occupation they involve! The anxiety to secure that delightfully sylvan nook, when the wind will keep the foliage in a constant tremor; the still greater anxiety as to how the plates will develop when some especially charming bit has been obtained under the best conditions; the inevitable presence of purpose in every phase of the holiday, each and all most delightful to the enthusiast, but all sternly forbidding the photographer to enjoy the dear delights of laziness so charmingly and subtly suggested in these *Tiny Travels*. Mr. Sterry in his travels never goes sternly to any purpose; he declines to have a purpose. He does not travel as the crow flies; but as the butterfly flutters. But he is the most delightful of travelling companions, always gay; but never boisterous. He illumines all that he sees with quaint fancies and odd reflected lights which invest it with new interest. His humour ripples and sparkles like a streamlet in sunlight; and, in spite of himself, and almost unconsciously to the reader, he conveys much odd pleasant information. We have not attempted to describe the book, we might as well try to analyse a perfume, but we simply conclude with commending it as a most pleasant companion for many a spare half-hour, affording in its reading a sense at once of refreshment and rest. And—if we must be practical—let us add that it contains a delightful chapter on Faded Photographs!

WILSON'S LANTERN JOURNEYS: a Series of Descriptions of Journeys at Home and Abroad, for Use with the Magic Lantern or Stereoscope. By E. L. WILSON. (Philadelphia: Bennerman and Wilson. London: Piper and Carter.)

If "*Tiny Travels*" are replete with graceful fancies, Mr. Wilson's "*Lantern Journeys*" constitute a perfect encyclopedia of facts in relation to travel. The idea is an admirable one. Several hundreds of the scenes of interest and beauty which the camera has produced for the lantern and stereoscope, on the Continent and in the East, in America and England, are here briefly and graphically described, just such vivid and salient facts being given as are most likely to fix the individuality of the scene on the mind. To every lover of the stereoscope, and to all in the habit of interesting young folks by lantern displays, this will form a welcome volume.

PHOTOGRAPHIC MOSAICS FOR 1875. Edited by E. L. WILSON. (Philadelphia: Bennerman and Wilson. London: Piper and Carter.)

MR. WILSON'S annual is, as usual, full of interesting matter, giving an admirable epitome of the practice of the best men connected with photography in the United States. We commend it as full of interest to English photographers.

THE TRANSIT OF VENUS.

A RECENT article in the *Daily News*, understood to be by a distinguished astronomer, has some interesting remarks in referring to the photographic success of Lord Lindsay's expedition to the Mauritius, and the special advantages of the method employed by Lord Lindsay of producing an image which requires no subsequent enlargement. The writer says:—

First of all, Lord Lindsay's party has secured more than two hundred photographs (one hundred and ten of them excellent) showing Venus at various points of her path across the face of the sun; and these photographs have not been taken by means of photo-heliographs, like those with which our *De la Rue* and the American, Rutherford, have obtained their beautiful sun-pictures. All the other European parties have unfortunately employed this photographically effective, but astronomically unreliable, instrument. (We deliberately say unreliable here, not untrustworthy, which would express rather more than we desire to imply.) Yet it has been mathematically demonstrated that, according to *De la Rue*'s own estimate of the probable error resulting from the use of photo-heliographic sun-pictures, the error in the measurement of the sun's distance would probably be greater than that which existed before the late transit. The method used by Lord Lindsay and the American astronomers is, on the contrary, almost perfect, theoretically. Let the difference, which does not seem to be commonly understood (for many erroneous statements have been made on the subject), be here briefly indicated. Suppose we have a picture of the sun, with Venus upon his face, taken by the photo-heliograph; and another picture of about the same size taken by the other method, which may be called the heliostat method. In examining the former picture, we know that there has been telescopic enlargement of the solar image formed at the focus of the object-glass; and in the absence of any sufficiently exact means of determining the amount of this enlargement, we must trust to the picture itself to indicate its own scale. There, in the picture, is the sun with the disc of Venus upon it, and the distance of Venus from the centre of the sun bears a measurable proportion to the sun's diameter in the picture. It might seem, then, that we know all that we want to know. But does the sun's diameter in the picture correspond to the reality? May not the collodion film have contracted to some degree? Or if we are quite sure that this has not happened, may not the apparent size of the sun have been enlarged slightly by what is called photographic irradiation? Unfortunately we have every reason for doubt on these points. In fact, the admission recently made by Sir G. Airy, that a Daguerreotype is infinitely more perfect in this respect than a photograph taken by the method which he has, nevertheless, officially sanctioned, can bear no other interpretation than this: that that method is unreliable, and that the results obtained by it are untrustworthy. Now take the photograph by the other method. In this a perfect plane mirror, carefully tested, is so moved by machinery as always to send the sun's rays in the same horizontal direction towards an object-glass having a focal length of forty feet. (The mirror acts thus as a heliostat—hence the name we have given to the method.) This length is sufficient to give a focal image of the sun requiring no enlargement (in fact, the image is about four and a quarter inches in diameter), and the astronomer is not concerned to know whether the actual photographic picture is correct. It may be enlarged by irradiation or diminished by the contraction of the film; but he knows exactly how large it is without measuring from its outline, for he knows the exact focal length of his object-glass, and the size of the image is thence calculable at once, being precisely the size of a circle which, viewed from that distance of nearly forty feet, would appear as large as the sun. But, indeed, as will presently appear, he is independent even of this determination. Again, the little white disc representing in the negative the black disc of Venus may have its outline blurred by irradiation; but whether much blurred or little blurred, it is equally blurred all round, and the position of the centre can therefore be exactly determined. Similarly the position of the sun's centre can be exactly determined, and the length and position of the line joining these centres are all that the astronomer wants to know. In the other method he can measure this line just as readily in inches; but, as we have seen, he does not know what an inch, or any other linear measure in his picture represents in angular displacement from the sun's centre. In the heliostat method he knows that an inch in his picture represents an inch seen at a distance of forty feet, or what-

ever may be the exactly determined focal length of his object-glass. In short, in one method the inches of the picture are directly comparable with inches of focal length; in the other they have to be compared with the inexact evidence given by the sun's picture itself, which has, indeed, a diameter of so many inches, but may, perhaps, have been photographically expanded or contracted. It is in this respect that the news from Lord Lindsay is so important. He has secured more than a hundred trustworthy pictures obtained by a really reliable method. The astronomical value of his station is about equal to that of Hobart Town, and nearly equal to that of the American station in New Zealand. Accordingly, we now have three excellent sets of southern photographs for comparison with those known to have been secured by American astronomers at Wladivostok and Nagsasaki.

Correspondence.

THE FADING OF SILVER PRINTS.

SIR,—I am glad to find by the letters in the photographic papers that the attention of many leading photographers is again addressed to the all-important question of the fading of silver prints. I think all old photographers should give us the benefit of their experience by mentioning the steps they have taken to secure the permanence of their pictures, and the results. If they will take this trouble, I am sure we shall gain much useful information.

Not wishing to preach what I am not prepared to practice, I shall tell what I have done; but before I do so, I may mention that I have been an amateur photographer for a great many years. I began with Daguerreotypes in, I think, 1843 or 1844, and have tried most of the processes that have since been brought out—Talbottype, Calotype, wax paper, wet collodion, and dry plates. I have devoted much time and attention to this most fascinating pursuit, and it is no great exaggeration to say, that for the last thirty years very few days have passed without finding me occupied with some branch of photography. The result of my labours lead me to take a more cherishing view of the permanence of silver prints than most photographers do. I believe that the fading of their prints is almost entirely due to some traces of hyposulphite of soda having been left in them.

It was, I think, in 1856 or 1857 that the Photographic Society of Scotland, of which I had the honour of being Vice-President, held their first exhibition in Edinburgh. I sent a great many pictures to that and the following exhibitions of that Society. I have now in this house, hanging in my rooms, a great many of these pictures, with the numbers of the exhibitions still on the frames. With two or three exceptions, they are all in *statu quo*, no trace of fading to be seen; but I can go back to 1854 and produce unfaded pictures of that date.

Here, then, we have prints that have stood the test of twenty years, although I lately read a very doleful letter in your paper by one of our greatest London photographers, in which he said that few, if any, prints would be found that had lasted fifteen years. Mr. Tunny, a well known and most successful Edinburgh photographer, taught me the collodion process. He impressed on me the necessity of washing out the last trace of hypo, and I have tried by various arrangements to do so ever since. In Edinburgh I had no convenience for washing prints; but I managed to do so by giving them from fifteen to twenty changes of hot water, and then a few washings in cold water. I placed them in a flat dish, not more than two or three at a time, and did not leave them in the hot water more than from one to two minutes, and I was always careful to drain off the last drop of water in the dish. It is a great mistake leaving prints to soak for a length of time in the same water; it is the constant change of the water, and not length of washing, that removes the hypo.

I reside for the greater part of the year in the Highlands of Scotland, and for the last sixteen or seventeen years have adopted a very simple arrangement by which, without any trouble, I can thoroughly wash my prints. I had an

oblong box of block tin made, about two feet long and sixteen inches broad. At each end, and for the whole breadth of the box, there is perforated zinc. There are two trays, so that I can have three lots of prints in at a time. I place the box in a stream, and allow the water to flow through it for four or five hours. Supposing the stream to run at the slow rate of a mile an hour, the print must have between eight and ten thousand changes of water in five hours.

Notwithstanding this thorough washing, I have had faded prints, but it was owing to having put too many in a tray; the stream rushing through the zinc netting crushed them in a mass against the end of the box, and in that way the prints inside the mass were not properly washed.

Photographers resident in towns cannot adopt this plan of working, but most of them can command a tap of water, and with a tub of block tin, a hole at the low side, a syphon, and a gutta-percha pipe communicating with the tap, they can wash their prints very well, provided they do not put too many in the washing tub at the same time.

I have mounted my prints in former years with flour paste, and latterly with starch, *always having it fresh made*. I see this mode of mounting pictures is pronounced to be certain destruction, but it has not proved so in my case.

I conclude this letter by saying that during the last twenty years I have printed many thousands of prints, and I have had thousands of failures, but these failures were, I am satisfied, due to some inattention in washing out the hypo; when that operation has been thoroughly carried out, my prints have stood the test of many years.—Your obedient servant,
HORATIO ROSS.

1, Southsea Terrace, Southsea, 13th January.

METALLIC SPOTS IN PRINTING.

DEAR SIR,—I see in your last week's issue an article on the subject of metallic spots in albumenized paper.

Your contributor seems unable to account for their presence, but, to my mind, the wonder is that there are so few. I am not acquainted with the details of the manufacture of photo. paper, but have been connected with that of ordinary book paper in this country for a number of years, and have very little doubt a similar process is carried out with a few extra precautions. M. Davanne says the particles can hardly be in the pulp, because the rags are so carefully overhauled, but he seems to forget that they are ground into pulp with steel knives. These not only collect scale and rust on their surfaces (which may, and will drop off into the pulp), but the knives themselves gradually wear away, and may throw off small particles of metal. The fact that the spots are found on the even side of the sheet, confirms me in the opinion, that they exist in the pulp, and are not communicated to the paper in any of the after processes. Anyone acquainted with paper-making, knows that if there are any metallic spots, they will be on the under side of the sheet. This will be plain to anyone when they consider that the pulp is run on to the wire in a very fluid condition, the heavy particles, such as bits of metal, naturally sink to the bottom, and are therefore found on the under-side of the finished paper.

The only remedy I can think of is, to use the best steel for the knives. The common qualities being much more liable to chip, and to see that they are kept free from rust. If you think the above throws any light on the subject, it is quite at your service.—Your's truly,

A PAPER MAKER.

THE NITRATE OF SILVER BATH, AND HOW TO USE IT.

SIR,—The question of the use of the nitrate of silver bath, its evils, and its remedies, is again come to the front. A few words on the subject from one who has eighteen years experience with its use, under all circumstances and conditions, may not be out of place. Particularly as photographers are invited to purchase secret processes, that are

alleged to cure all the evils incident to its capricious nature. To assert that there is nothing in the "secret processes," would, in my opinion, be saying too much; one gentleman at least who offers it for sale, is a careful experimentalist, and has in another secret process produced work worthy of imitation. But how much there is new in the matter is another question. If photographers would only exercise care and judgement in the management of the bath, there would be no need of purchasing ideas from other people. It is laid down as a matter of fact, that the larger the quantity of bath in use the less likely it is to get out of order; this, experience has borne out to be strictly correct for obvious reasons, which I will refer to directly. In my usual practice I do not use what is termed a large quantity of solution—from a quart to three pints is about the outside—but I can safely assert that I have never had to discard a bath from over-work, it has been from sheer accident whenever such a thing has taken place. My usual practice, is to make a bath of rain water, first putting a few grains of silver to precipitate any impurities. Then, with ordinary nitrate of silver, make a bath of thirty-five grains to the ounce. Sun again for a day or more, and filter, then coat a large plate, allow it to remain over-night, test for acidity. If not sufficiently acid, take pure nitric acid diluted and let a slight reaction be on blue litmus, and your bath is in working order, and will continue to improve for the first two or three days when you will have it in the finest condition. Now the grand secret is to keep it in this condition. This in my practice has been done, by simply replenishing with new plain forty-grain bath, and by simply keeping a cover of cloth over it to keep out dust, but that will allow the evaporation of ether and alcohol, the accumulation of which is the cause of some of the evils that the bath is said to be heir to. It is too much in practice of photographers, during the busy time, to forget how quickly they impoverish the bath, abstracting the silver to a far greater extent than the liquid, and are only reminded of it, when poor and thin negatives that will not intensify make their appearance.

At this stage, replenishing the bath will make it, as a rule, all right. But things should not be driven to this extremity at all. After two or three days work the bath should be made up to its proper strength, and things will go on smoothly and pleasantly as before. In my practice, if these things are attended to, there will not be much to complain of pinholes occasioned by nitrates in the bath, or crystallization from the same cause through excess of ether and alcohol. It must not be over-looked, that the larger the quantity of salts in the collodion the stronger must be the bath. But most commercial samples average about the same. Keep the bath up to an even temperature, winter and summer, and to an even strength, allowing facilities for the evaporation of ether and alcohol, and there will be no need to buy secret processes. There is nothing new in what I have said, but it may be worth something.—I remain, sir, yours, &c.,
THOMAS TEDRAKE.

Bideford.

SECRET PROCESSES.

SIR,—I can only endorse similar sentiments to some of your correspondents. It is seldom I write now for either *Journal* or *News*. "Process selling" at the present day seems to have got a "rage" or "fashion." I can well remember the time when such would be ignored. True, many old "dodges" have taken new names: old processes sold as new, and vended freely. The last one I purchased I was told was something quite new—"never before" published or used. When I got the secret, lo! I found it in print as soon as I got home.

For my own part, may I ask what are photographic societies for? I know full well I shall get, perhaps, a "warming." Pray readers excuse my bluntness. I am pure from the country, and cannot boast of high flown language, but use my pen in my own fashion; and you must take the words that come from me in good part. Our

societies should be for advancement and improvement, and really to test processes the same as our scientific associations. Very true, we have clever men—men who devote much time experimenting, and expend money in going through the various formulae, &c., and I also maintain that these gentlemen should be repaid; but the question arises how, and by what means?

Professional men should by all means belong to some photographic society, and contribute their share to such institutions, so that it would give the president and committee a chance; and in large towns where there is no society let them join the nearest, and give a helping hand to raise a fund for testing and proving vended processes. I saw a picture only the other day—a good one, true—and the background was put in powder colours, and shadows glazed; it put me in mind of days gone by glass pictures, when many times I wondered how these effects were produced, and by an amateur coach painter. This we called rubbing-in, and have used common carbon from the fire grating.

Many of my own county readers will remember, when Baume was in Leeds, powder colours were used by this gentleman's artists (some Germans), and another establishment had this clever coach painter, which, for simple effects, were by far the best. We have now a similar method patented, and I have seen Mr. Stortz produce the same effect cleverly, only in colours blended so well, creating harmony in the whole picture. Mr. Stortz's was the first I ever saw on paper. I don't grumble, mind. Far from it. But I do think that our societies should enter into these things; and let the whole fraternity assist in helping them.

For myself, I have the Winstanley process of pre-lighting. I have my own opal glass, and the Flapper; and those who don't know what that is send me their address, and I will tell them, and charge them nothing. In this county we have had very bad weather. True, many work with full aperture, with Ross 3, and No. 2B Dallmeyer. I don't. My weakness is for sharpness and softness combined. I have given the withdrawing the diaphragm a fair trial, and cannot boast of much quickness. My average in summer is twenty-five to thirty seconds; spring, sometimes twenty seconds; but I have now gained some ten to fifteen seconds by withdrawing the diaphragms.—Yours, &c.,

AN OLD HAND.

The Studio, Whitehaven, Jan. 18th, 1875.

SECRET PROCESSES AND COMMITTEES OF INVESTIGATION.

SIR.—The very excellent suggestion contained in the pertinent observations made by Mr. Young in your issue of the 1st instant, runs some risk of being lost sight of by a misconception of their meaning. Mr. Young's suggestion was, if I understood him rightly, that fifty good men and true should undertake the examination of new methods which were duly published, and so avoid the necessity of buying secret processes. Mr. Edwards seems to understand that the proposal was, that a committee of fifty photographers should be formed to test secret processes, a thing manifestly impossible. This, Mr. Edwards sees clearly enough, and he suggests that a committee of five trustworthy men would be sufficient to test and report upon the value of a secret process offered for sale. This is probably true enough; but it does not seem very likely that such valuable committees will be readily found to undertake such a duty. For whose profit should they undertake such a responsibility? If it be true, as it is frequently alleged, that "secret processes" are generally processes which have at some time been published, and that the work of the "process monger" consists chiefly in working them out to a successful issue, fifty good men and true could do the same work without involving any secrecy.

Mr. Edwards rightly says, "we must not always expect to reap the advantage of every improvement and give nothing in return," but it is a fact that almost every discovery,

every great improvement in the art, has been given freely to the public, and the injunction "freely you have received, freely give" is peculiarly applicable to photographers. Having freely received, photographers should be willing to give some time to testing new things, and to give freely the results of their investigations. This is what they should give in return; and if they would adopt the suggestion of Mr. Young, they would have little need for purchasing secret processes. The suggestion in Mr. Hooper's paper that committees of investigation should be appointed by photographic societies, is a most important one, and well worthy of being carried out.

The note to Mr. R. W. Preston's letter in your last, seems to cover the entire ground in relation to secret processes. Those who are anxious to obtain the results of the investigations of others, without investigating themselves, ought to be willing to pay for them, and to take the risks of buying a "pig in a poke."—Yours, SENEX.

THE SIMPLEST AND BEST MODE OF ENLARGEMENT.

SIR.—Your correspondent, "A Provincial Photographer," in last week's issue, asks me to give a simple and effective plan for enlarging from card negatives to about ten inches, which can be done at a nominal expense and produce a good result. I have much pleasure in communicating the method, in daily use in my establishment, by which such pictures are produced, that it would never occur to anyone to suppose they were enlargements. Of course, I mean, the enlarged plates will not exceed ten inches in size. When you exceed that a different procedure is required.

Procure from Spencer, Sawyer, Bird, and Co. a four-shilling packet of special transparency carbon tissue, and, following the perfectly simple instructions given in their Manual, or in several places in the *News* and recent *Year-Books*, print transparencies from the negatives; this four-shilling packet will print about one hundred and fifty, so the expense is not great. No one who once employs carbon transparencies ever goes back to collodion. From this, taking care not to reverse the enlargement, make, by the usual well-known means, an enlarged negative. A hole in the side of the dark room or a cupboard to hold the transparency answers every purpose. Do not varnish the enlarged negative, but cover it with albumen diluted. When this is dry, lay over it back and front the papier vegetal, which may be procured at Messrs. Marion's, price four shillings and eight pence per quire. On this work, in Mr. Lambert's method, as described in your number for October 23, 1874.

Nothing can be more simple or less expensive than this process and nothing more satisfactory than the result. The object in using carbon for the transparencies is because by so doing the lighting and delicacy of the original negative are carried forward to the enlargement, but we all know too well with a collodion positive how opposites is the result occasionally.

Your correspondent will, I am sure, believe me when I say the above method is not theory but practice, and is in successful use every day in my business.—Very respectfully, SAMUEL FRY.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE last meeting of this Society, held on Thursday last week, was of a semi-public character, there being also a large attendance of ladies. The Rev. F. F. STATHAM, M.A., President, occupied the chair, and after the transaction of some routine business, Messrs. Reynolds, G. Hare, Grainger, Croisdale, and Azulay were admitted members.

Mr. FRY exhibited a print from a negative that had been submitted to the members at a previous meeting of the Society, and some carbon transparencies.

Mr. SPILLER exhibited the nitre-sulphur light, and demonstrated

the purity of the flame by means of a card containing specimens of silk of various colours. The fused nitre balls he considered to be a convenient form in which to use the nitrate of potash.

A large collection of transparencies lent by Messrs. Hunter, York, Howard, Kennett, and others were then exhibited by Messrs. Oakley by means of their magic lantern, and Mr. Gore gave a description of some views in India that formed a portion of the series thus exhibited. The exhibition was very successful throughout, and afforded much gratification to those present.

Talk in the Studio.

ACTINIC LIGHT.—The *Athenaeum* says:—"When the vapour of bisulphide of carbon is mixed with nitric oxide gas, the mixture, on ignition, burns with an intensely luminous flame of high actinic power, but of only momentary duration. M. Delachanel and Mermet have, however, recently succeeded in producing a lamp in which this gaseous mixture may be conveniently burnt, and thus applied to photographic purposes. The nitric oxide is generated by the action of iron on a mixture of nitric and sulphuric acids, and after mixture with vapour of bisulphide of carbon, the mixed gases are burnt in a kind of Bunsen's burner, the products of combustion being rapidly carried off by a chimney. For the purposes of the photographer this new flame is said to be superior to that of the magnesium lamp, whilst it is estimated to have twice the chemical power of the oxyhydrogen flame, and three times that of the electric light.

IMMENSE PHOTOGRAPHS.—There is now on exhibition in Paris, says the *Revue Industrielle*, the two largest photographs which have been made since the introduction of the art. One of these photographs represents the principal facade of the new Opera, the other one of the bronzes—the Departure, by Rude—of the Arc de Triomphe de l'Étoile. Each of these prints measures four feet three inches in length and three feet four inches in height. They were obtained in one single piece, by well-known processes, and with the aid of a large and specially constructed camera. Except in some of the effects of perspective which, perhaps, are not reproduced with absolute fidelity, especially the portion representing the dome of the grand Opera, which appears, on the photographs, to crown the facade instead of being in a plane further back, all the lines of the pictures are of remarkable excellence; the mouldings, the busts, the medallions, the inscriptions, and even the minutest details, being reproduced with rare perfection. The attempt is being made to secure pictures even larger than this."

PHOTOGRAPHIC PRINTS IN PLATINUM, IRIIDIUM, ETC.—The *Polytechnisches Notenblatt* gives a process by Mr. Willis, as follows:—"The paper is floated on a solution of one part potassio-platinic chloride in forty-eight parts water, dried, saturated with plumbic nitrate solution, 1 to 12, dried a second time, and then painted with a solution of ferric oxalate, 1 to 8, to which a little oxalic acid has been added to render the iron salt soluble. When dry, the paper is exposed under a negative, and the weak brown picture produced floated on a hot solution of potassio-oxalate, which develops it to a deep black. It is then washed in a dilute solution of oxalic acid, next in hypo bath, and lastly in water. Argentic nitrate may be substituted for the lead salt, or platinic bromide with ferric tartrate for the potassio-platinic chloride.

To Correspondents.

C. R. P. VERNON.—A solution of sulphocyanide of ammonium should contain about one ounce of the salt in three ounces of water, and the time of immersion about the same as in the ordinary hypo fixing bath. The sulphocyanide will keep perfectly well either in crystals or in solution. Great hopes of its superiority to hypo were entertained when it was first proposed, about a dozen years ago, but these were not fulfilled by later experience, as it was found that the traces of the sulphocyanide of silver, almost impossible to remove by washing, gradually caused the print to darken under the action of light.

P. RYTON.—We believe that Captain Abney still uses, and believes in the excellence of the albumen and beer process. When he returns from the East, which will be very shortly, we shall have opportunity of ascertaining further, and we shall then let you know.

W. G.—You will obtain seed lac of any drysalter, or of many chemists or oilmen and colourmen. We cannot tell you the price. **ELECTRA.**—We do not personally approve of the method of iodizing a bath by leaving in a plate. The streaks in the direction of the dip may proceed from several causes. You will do wisely to make your bath always in the manner which experience teaches you gives immunity from such streaks. 2. The use of any kind of powder to abrade the surface of the varnished negative, and so obtain a tooth for a lead pencil, involves very great risk, and should be applied only with the greatest skill and care. We never find any trouble in obtaining such a tooth without the aid of abrading powder. Gentle rubbing with the end of the finger, without any powder, will secure a surface on which the pencil will bite. The application of a little turpentine upon the varnish will generally give such a tooth. The use of a matt varnish will give such a surface. The application of the spirit varnish to the plate without much heat, especially if the varnish has been made somewhat thin by the addition of spirit, will give such a surface.

F. W. REYNOLDS.—Many things will, of course, affect the quality of the final tone of a picture; but in your case it is not the paper or the toning bath, but the negative. The print you enclose possesses, in our estimation, a very good tone; if it had been toned further, to acquire a blacker tone, it would inevitably have become somewhat flat and weak. To permit toning to an intense brilliant black, the prints must be produced from a very vigorous negative with strong contrasts, permitting deep printing. If the negative be thin and soft, the best and richest tone it will yield will always be of a somewhat warm tint. If the toning be carried further, it will be, in such case, grey, not black. 2. In some cases undoubtedly a printing bath will become contaminated by use, besides losing strength; but we have rarely found it necessary to do anything but add sufficient silver. Possibly in renovating you are not careful to do this. The argentometer is of very little service in such a case.

J. NELSON.—The image appearing on applying the developer, and then at once disappearing, is still simply a case of fog. Such fog may proceed from many causes. It may be the alkaline condition of the bath, in which case a drop or two of nitric acid will cure it. It may be that the bath is contaminated with some foreign matter, in which case neutralizing and sunning, or boiling will be the remedy. It may be that light reaches the plate in the dark room or camera, in which case the remedy is obvious. It may be the use of very new collodion, or other causes, which must be sought for one after another until the right one is found.

X. Y. Z.—The addition of cyanide to a disordered negative bath is a favourite remedy with many operators, and is often found beneficial. The effect of the addition is the formation of a precipitate of cyanide of silver, which carries down with it impurities present in the bath, and so purifies the solution. 2. A camera obscura is practically the same as a photographer's camera. As a rule, a less perfect lens than those used in photography is employed, and the image, instead of being received on a ground glass, is received on a mirror, by which it is reflected on to a horizontal surface easy to examine. It is used sometimes as an interesting aid to viewing scenery and groups, and sometimes as an aid to the draughtsman.

HOPFUL.—Your diagrams are scarcely sufficiently complete to enable us to form a very perfect idea of your plan; but so far as it goes, and so far as we understand it, the idea seems to be good, and to promise facilities for obtaining a variety of effects. Blinds and curtains depend much on circumstances. As a rule, we prefer curtains of white or blue calico sliding on wires.

C. MAGRANE.—We have no personal knowledge of what is the most saleable size of photographic landscapes. We can only suggest the results of observation. Mr. Bedford chiefly produces landscapes of 12 by 10 and stereoscopic size; Mr. England produces whole-plates and stereoscopic size; Mr. Wilson, of Aberdeen, produces stereoscopic and about 7 by 5. These are three of the most distinguished landscape photographers, and we presume that they produce the sizes which experience has taught them suited the public taste. The subscription to the *PHOTOGRAPHIC NEWS* and postage is 16s. per annum.

S. S. YOUNG.—Received. We shall have pleasure in forwarding your membership at the meeting in February. We are obliged by the expression of your good opinion. The Year-Book has been forwarded.

C. A. B.—The iodizer you have used is a very good one, and will doubtless, if the collodion itself be good, give you satisfactory results. The colour does not depend upon the amount of the iodizing salts; you might put three times as much, and still have a colourless collodion. The colour depends on the free iodine, which is liberated by age, and will probably appear in yours as it gets older. The chief advantage of this free iodine is, that it generally aids in securing clean shadows. You may easily produce it by adding a little tincture of iodine.

W. TRYACK.—The border is very neat and good of its kind; but we confess to a dislike for ornamental borders to cards. Several Correspondents in our next.

The Photographic News, January 29, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE THEBES TRANSIT OF VENUS EXPEDITION—PHOTOGRAPHY IN COURTS OF LAW—PHOTOGRAPHIC TRANSPARENCIES—SECRET PROCESS MONGERS.

The Thebes Transit of Venus Expedition.—We are glad to announce the return, during the past week, of Captain Abney, R.E., to this country after his rough campaign up the river Nile. It will be remembered that Captain Abney, who was in command of the station at Thebes, was singularly successful in the observations he made, for not only was the weather exceedingly clear and propitious, but being probably the most skilful photographic observer that had been sent from this country, he was perfectly competent to take every advantage of the opportunity. He employed a Janssen's slide in the operation, so as to secure as many pictures as possible, and he is, everything taken into consideration, very well satisfied with the results he has been enabled to place in the hands of the Astronomer Royal. We are sorry to say that the anxiety and change of climate have caused Captain Abney's health to suffer somewhat, and he has been compelled to obtain leave of absence from Chatham; a little quiet and repose after his labours, will, we hope, speedily restore to him his usual strength and vigour.

Photography in Courts of Law.—There was a very good illustration in the recent libel case of *Rubery v. Grant and Simpson*, of the power of photography in affording convincing proof in matters relating to documents. The plaintiff, in order to show collusion between the defendants, produced photographs of a series of cheques which had passed between them. We need not go at all into the matter as to how the plaintiff possessed himself of these cheques in order to get them copied; whether he did so by suborning one of Grant's clerks, or in any other way, as this is of little importance. As he could not produce the documents themselves, he showed copies thereof taken by means of the camera, and thus he was enabled to establish his point on the strength of photography alone. If the defendants had destroyed the originals, or had refused to produce them, it would have mattered very little indeed, for the photographs would have convinced the jury quite as much as the cheques themselves; and what is more, the signatures and handwriting could have been sworn to if necessary, just as easily in the one case as in the other. The employment of photography is thus shown to be so eminently suited for legal purposes in cases where the proof of documents is necessary, that it is really a matter of surprise that our law courts do not avail themselves more extensively of the camera, and have photographers attached to the court who might be employed independently in any case of dispute that might arise. Where it is merely a question of copying documents, the camera is, of course, eminently impartial, and any photographer might be conveniently employed; but it sometimes happens, as in the *Tichborne* case, that pictures would be far more satisfactory if taken by officers of the court itself. It will be remembered, in the case to which we allude, that the Lord Chief Justice threw grave suspicion upon some photographs of "the Grotto," executed in perfect good faith, which, his Lordship was of opinion, did not fairly represent the place in question, and disbelieved in entirely. As we pointed out in these columns, his Lordship was sadly at fault, for the pictures were of a perfectly *bona fide* nature, and were altogether untouched by the photographer who secured them. Now, in a case like this, a photograph would never have been suspected if it had been taken by a photographer attached to the court, and then all would have received the picture as good evidence. Such a plan of proceeding would be satisfactory to all parties of a suit, for it cannot, of course, be denied that there are always two ways of taking a landscape picture. By substituting

one lens for another, and shifting the position of the camera so as to alter the foreground, a great deal may be done to alter the aspect of a landscape. Thus a wood, or group of trees, may be divested of all charm by taking a picture with a bit of moorland or rugged foreground in front, and employing a very wide-angle lens to exaggerate the inhospitable nature of the ground in front, and dwarf the beauty of the scenery beyond. On the other hand, again, a copse may, with a little skill in choosing the point of view, be made to look like a vast forest, or, at any rate, a portion of one, and an estate appear extensive or otherwise, at the option of the photographer. For these reasons and many others, it would be well for a court of law to have a photographer among its officials, and the time, we think, is not very distant when such will be the case.

Photographic Transparencies.—There is no more favourable way of looking at a photograph than as a transparency. Take the finest paper print you will, and after admiring all its beauties by reflected light, hold it up against a strong light and see how more plastic and delicate still it appears. Glass transparencies, such as one sees exhibited against windows or upon tables with reflectors underneath, always gain unbounded approbation; and it is really surprising how much detail a hard under-exposed negative has when a print is taken off upon glass and held between you and the light. If we could only suggest some more practical way of showing and keeping pictures of this kind, they would soon become the most favourite form of photograph. As it is, transparencies are now produced in large numbers by photographers for exhibition in the magic lantern or sciopticon, and there are few things so pleasant of an evening as seeing pretty views and quaint bits of nature reflected upon a screen, and enlarged to a size that permits of every detail being visible. Glaciers and torrents, huge rocks and mighty waterfalls, lose their pigmy proportions and appear more like what they are in nature, while details are seen which before were never known to exist in the photograph. Photographs are slowly but surely taking the place of the ordinary magic lantern slide, and soon, no doubt, we shall have to record their disappearance altogether.

Secret-Process Mongers.—Complaints come to us from abroad about process-mongers who visit provincial towns especially, with secret methods of one kind or another for sale. It is singular that this line of business should be a lucrative one, but such it evidently is, otherwise we should not hear so many warnings and complaints. In Germany, we are told, the travellers give out generally that they come from England, and have processes of the greatest importance for sale, and, as a rule, they scarcely ever go away without doing some business. There are, no doubt, some of the craft who deal in *bona fide* matters, or, at any rate, themselves believe in the value of the method they have to sell; but, as a rule, the secret imparted is one which is to be found in journals, altered a little, perhaps, but not materially. All people, however, like mystery, and the success which attends process-mongers is, no doubt, due in a great measure to their dealing in secrets, the intrinsic value of these being a matter of secondary condition. We do not remember any instance of a photographer having made a good speculation by the purchase of secret information in this way, and for this reason we advise our readers to think twice before they effect a purchase of this kind. Fortunately we are not much troubled in this country by travellers of this sort, who are to be heard of much more frequently in France and Germany.

IMPROVING LARGE NEGATIVES.

BY GEORGE CROUGHTON.*

The print being taken from the printing-frame, is placed against a plate of glass the same size (*viz.*, 20 by 16), and a piece of tracing paper about one-third of an inch larger

all round is placed upon it. Now, with the BB pencil, mark out the outlines of the figure, keeping *inside* the lines. Having done this, the print can be put away till the mask is ready. Next damp the tracing-paper in the manner before described, and place it upon the glass plate, and turn over the edges and fix with strong gum. When this is dry, fill in the figure with the plumbago and cuttle fish powders with the finger in the same way as described for stopping out the background. When this mask for the figure is thickened enough to protect the figure while the background is printing, I proceed to put in light and shade and detail for the background upon the clear tracing paper. Here the artist will have the advantage over the photographer who cannot draw, as almost anything can be done upon the tracing paper in the way of light and shade, and even pictorial backgrounds can be put in with the stump and powdered lead, &c.; but with the picture I have been describing I want to put in a dark background relieved by light and shade, with, perhaps, some indication of panelling, and I proceed as follows:—

With a large tuft of cotton-wool well rubbed into the mixture of plumbago and cuttle fish powder, I rub an even tint all over the tracing paper which is round the mask for the figure. Now notice which side the light falls upon the figure, and with a clean piece of cotton-wool clean off some of the lead on that side of the mask, carefully graduating the colour with more and more cuttle powder. Now, upon the shaded side, rub on more and more colour just round the head and shoulders, graduating it in the same way, and rub off the colour from the lower corners of the plate and also from the upper ones. Some taste and judgment is necessary here to get the effect of the light fully upon the background as a support to the figure. To put in a panel, as upon a panelled wall, the shadow must be taken out boldly with a piece of india-rubber or bread, and the light marked in with the BB pencil. If deeper shadow is wanted, then gum the part to make it more transparent. The mask being now ready, it is placed in a large printing-frame with the tracing paper next the plate glass, the print being adjusted against the glass side of the mask so that the figure is protected, and it is placed out to print. It must be carefully watched, and if some plates want more intensity, a rough lump of cotton-wool held in the hand and moved about will keep the light from those parts, while the other parts print deeper. If the panelling or any other work upon the background should not be sharp enough, any amount of sharpness can be obtained by varnishing the glass side of the mask with Hughes's matt varnish, working upon it with the pencil for lights and gumming for the shadows. By the use of the both sides of the glass any design can be drawn; but I prefer the indefinite suggestion of detail which is obtained by working only on the tracing paper. It is more in keeping, and makes the background retire from the figure.

If the picture is to be vignettied, there is much less trouble, the figure having been blocked out on the negative, as described in the last paper, is placed in a printing-frame which has a ledge some inch and a-half from the plate. A piece of card is roughly cut to form a vignette, with overlapping piece of tracing paper at the bottom to soften off the drapery. The print from this will be a vignette upon a white ground. This is placed in the large printing-frame, face to the plate glass, and exposed to the light, the face, hands, and any white drapery alone being protected with tufts of cotton-wool, and any light and shade put in or modified with a piece of wool kept moving over those parts which need it.

I have lately had an order which has tested this method to the utmost: a 20 by 16 enlargement of a boy in a sailor costume who was standing inside a room with the usual photographic accessories—chair, curtain, &c. The background was faulty and spotty, and in the enlargement the streaks were much too distinct. My customer

expressed a wish that the background should be done away with, and something in keeping with the costume introduced, and this was effected as follows:—

The negative having been treated as before described for blocking out all but the figure, I printed just the figure and carefully cut it out with a pair of scissors upon a stretcher some inches larger than required; I strained a piece of thin plain photograph paper, and, temporarily attaching the figure of the boy to it as a guide, I put the stern of a boat in place of the chair, and an indication of sea and sky behind him. This was done in a very few minutes with the plumbago and BB pencil. Having taken off the boy, I made the paper transparent by brushing over the back a mixture of alcohol and castor oil, as described in the *News* some time back. This being placed in contact with a silvered piece of plain paper, was printed, and the result was a paper negative, which, after being toned and fixed in the usual manner, was made transparent in its turn, and the cut-out mask of the boy being adjusted in its place, was ready for printing-in in the usual way. Of course, I found I could improve this paper negative with the powder lead, and also by fixing tracing paper upon the other side of the glass and working upon that. These are little things that experience alone can teach. If I can get to London before the holidays of the societies commence, I hope to be able to exhibit some of the pictures I have produced by this method.

THE ORIGIN, AIM, AND ACHIEVEMENTS OF THE PHOTOGRAPHIC SOCIETY, WITH SUGGESTIONS AS TO ITS FUTURE DEVELOPMENT.

BY GEORGE HOOPER.*

I now come to my second heading, viz.:—"Our claim upon the Government for a money grant and suitable premises wherein to hold our meetings, exhibitions, and have permanent offices." In order to prove the important position held by photography in the various departments of Government, I shall enumerate some of its establishments, its applications, and the benefits derived therefrom.

1. The Ordnance Survey office at Southampton, under Sir Henry James, where zincography has for so many years been successfully practised, causing an immense saving to the country.
2. The Indian branch of the above, under Captain Waterhouse, R.A.
3. Greenwich Observatory, where the declination of the magnet is daily registered, and observations are made by our late President, James Glaisher, F.R.S.
4. Woolwich Arsenal, where all alterations in military drill and equipment, heavy ordnance, and designs of all kinds are photographed, resulting in a great saving of time and expense, such work having been so successfully executed by our President, John Spiller, F.C.S.; and now by our late Secretary, H. Baden Pritchard, F.C.S.
5. The Chatham School of Military Engineering, the photographic department being under our active and eminent Member of Council, Captain Abney, R.E., F.C.S.
6. Again at Shoeburyness, where torpedo experiments are photographed instantaneously, and the effects of heavy shot upon iron plates most truthfully and efficiently depicted.
7. The photographic work at the South Kensington and British Museums.
8. The photographs of the pictures of the National Portrait Gallery [copies of which were sold by the Government at a price that seriously affected the profession, decidedly an error of judgment and tending to depreciate the art].
9. Photographers were considered essential to the complete equipment of our armies during the two late

wars in Abyssinia and on the Gold Coast. As respects other benefits derived from photography we may mention the part played by micro-photography and the pigeon-post during the recent Franco-Prussian war. What thousands of families were made happy, both in London and Paris, through micro-photography, as developed by M. Dagron during that eventful period! so that a full sheet of the *Times* was reproduced on a collodion film very little more than one inch square, and by the aid of pigeons conveyed from one quarter to another.

Again, the photographing of the recent Transit of Venus has been an application to science the value of which cannot be over-rated, not forgetting how useful the art was in photographing eclipses many years ago, for which an expedition was fitted out under the command of Colonel Tennant, R.E., and Norman Lockyer.

Photography has done much for science; has furthered art and many industries; has saved the Government and the country tens of thousands of pounds, and (we believe) a serious rupture with a European nation, if the secrets of the Foreign Service were searched to ascertain the fact.

Surely an art that has done so much for science, as well as for industries, deserves to be recognized by the Government and receive some encouragement in order to further develop such useful investigations.

It is this that inclines me to suggest a call upon the Government not only for an annual grant for scientific investigations, but also for premises to hold our meetings, our annual Exhibitions, and permanent offices where a studio and all appliances necessary to a good establishment should be found, and instruction given to all desirous and willing to avail themselves of the same.

I now come to my third and last heading, viz.:—"The necessity of forming committees for scientific investigation that shall annually report their results to the Society."

In order to prove the necessity of such committees, I mention a circumstance that occurred only last Session. Dr. Vogel asserted "That the red and yellow rays of the solar spectrum are capable of making an impression upon tinted collodion surfaces; that is, that a reddened collodion is sensitive to the red rays." Dr. Van Monckhoven,* John Spiller, and Carey Lea all dispute this position: why not, then, settle the matter permanently by an experimental committee appointed for the purpose, as would be done by the French Academy of Sciences?

I would venture to suggest four subjects that might immediately be placed in the hands of committees, to be reported upon to this Society by the end of the Session or the opening of the next:—

1. "Whether a substitute cannot be found for albumen that will secure permanency to silver prints."
2. "How much nitric acid should be used in the negative bath to obtain the best results and secure regularity in working."
3. "Whether a dry-plate process cannot be perfected that shall be as rapid in its results as the present wet process."
4. "Whether, by employing a more sensitive agent than iodide or bromide of silver instantaneous photography may not be achieved."

It is a notorious fact that many minds are at this moment employed working out certain problems: why not make some arrangement whereby these may be brought together? and then we shall assuredly realize rapid and valuable results. There are many here that will bear me out in this assertion, and we have a continual proof of the same; for when anything new and valuable is published some one says, "I was at work at the same thing, and have been for years."

Let us, then, do our best to start these committees at once, and, if possible, have a committee in London and a committee in Liverpool or Edinburgh, work together in

the same direction for the same object, and communicate results.

Another suggestion I would make is, "increased sociability." How can this be brought about? Some think by open-air meetings; but I believe John Bull is particularly fond of a good dinner-party. Charitable institutions raise thousands of pounds by dinners; why not try this plan with scientific institutions? It is true we have a chat over a cup of tea or coffee and a biscuit after every meeting; but what is this to an annual dinner with the Prince of Wales or Duke of Edinburgh in the chair? I fully believe in an annual dinner; let it be something after the style adopted by the Royal Academy and other societies.

Again, I think it a great pity that evening dress at our annual soirées was ever given up. Let these gatherings be opened with all the *eclat* possible: it helps to raise the status of the art in the eyes of the educated public.

One suggestion as regards our ordinary monthly meetings. Nothing, we believe, is more interesting to members, or more likely to draw out discussion, than illustrations of anything that is new by a practical demonstration of the process. Every possible convenience is given for this to be done, and expense should not be spared. I would just throw out the hint here that if every member brought a lady to our monthly meetings I think it would tend to increase the interest. It is well known that many ladies take a great interest in the art, and it might be the means of inducing some to join the Society.

Lastly, one word in favour of an annual congress of photographers, and the formation of a "British Photographic Congress." I have both spoken and written in favour of such a scheme as most desirable; and although the Photographic Society of Great Britain has, I believe, a more useful field of labour before it, yet I feel the Society will willingly use all its influence to further such a scheme, especially seeing that the photographic department of the British Association for the Advancement of Science is such a failure*—and not unexpectedly so, seeing that photography, as still a young art, is only very partially understood by scientific men. They feel and know its importance, they see its results, but cannot enter into its failings practically, or lend a helping hand to its advancement.

It is one of those pursuits that require constant study as well as a lively interest in order to enter into its requirements and appreciate its usefulness and applications.

In conclusion, I again repeat the resolution it is my intention to move at the next Annual Meeting of the Society, and trust that it may lead to the adoption of some of the suggestions I have thought it right and proper to make. The resolution is as follows:—

"That it is the wish of this meeting that the Council shall immediately take into consideration whether it would not be for the interests of the Society to procure a Charter of Incorporation? and also that a special meeting of the Society be called as soon as possible to hear the report of the Council thereon, and pass any resolution that may be necessary in order to give the Council power to act."

DEFECTS IN ALBUMENIZED PAPER; THEIR CAUSE AND PREVENTION.

BY DR. J. SCHNAUSS.†

So long as albumenized paper is employed by photographers in the production of their prints, so long, doubtless, shall we have to listen to complaints regarding it. Practised operators have learnt how to circumscribe many of the difficulties that arise, and know how to help themselves on most emergencies. They know that it is not the albumen that is generally at fault, nor the

* Since further examination of the subject, Dr. Van Monckhoven no longer disputes Dr. Vogel's discovery.—Ed.

* This allusion is made in error: there is no photographic department of the British Association. Many photographic papers have been read, however, in sections devoted to physical and chemical science.—Ed.

† Extracted from Schnauss's report on albumenized paper.

albumenizer, but that, in most instances, the paper itself is the cause of the defects which arise, as also its storage, and the photo-chemical process to which it is subjected. It would be as difficult to find a universal remedy against failures in albumenized paper as to discover the elixir of life, or a medium that would cure all the diseases that flesh is heir to. What my colleagues and myself have learnt, however, after years of experience, and by a thorough investigation of the subject, I shall be happy to write down here for the benefit of my readers.

Speckled Prints.—The tyro in photography generally makes the acquaintance of these phenomena first of all when the prints are lying in the toning bath, observing upon some of them tiny red spots which, as the operation proceeds, become more and more marked; while the print becomes darker in tone, the colour of the spots withstand the action of the toning bath, and are, therefore, after a time, more apparent. They seem to disappear somewhat in the hyposulphite bath, because the tone of the pictures is cleared up a little by the action of the soda.

An experienced printer will detect these faults as soon as he takes the prints out of the pressure frame; a close inspection of such albumenized paper, whether before or after sensitizing, is often sufficient to detect the imperfection, before the material is laid upon the negative, for they then appear as matt and brilliant spots upon the surface of the paper. The defects are due either to the imperfect separation from the albumen of fibrous matter, or to the unequal absorption of the albuminous liquid by the paper. According to M. Sternfeld, the latter defect is caused from the fact that the only two manufacturers of paper of this kind do not keep a sufficient store of the material, and the albumenizers are thus compelled to employ fresh paper, the sized surface of which is not dry enough. Unequal absorption of the albumen, therefore, takes place, and thus the defects to which we have alluded, are caused.

It would be better for this reason never to employ fresh paper, but always that which has been stored up for some time. But even in this case we are not altogether free from our old enemy, for, truth to tell, the same is not always due to the imperfect desiccation of the sizing, and was known long before the question of a dearth of paper in the market arose.

If it is not actually in the power of the photographer to prevent this defect altogether, he can do a great deal to remedy and render it almost unnoticeable. The precautions to be adopted are as follows:—

1. Employing a fresh and not too weak silver bath.
2. Careful washing of the prints in clean water before toning.
3. Using a weak gold bath in abundance.

The fresher and stronger the gold solution, and the more quickly it tones, the more pronounced will the specks upon the prints appear. For this reason baths prepared with carbonate of soda, which are employed at once, are very prone to produce the defects, while old gold solutions made up with acetate of soda, do not produce speckled prints so readily. Especially to be recommended for the purpose is the arseniate of soda toning bath, which is made, up according to C. Durand, of:—

Arseniate of soda	...	...	20 grains
Chloride of Gold	...	...	1 grain
Boiling water	...	...	6 to 8 ounces.

As soon as the mixture has cooled, it may be used for toning. Every time it is employed there must be added to the cold bath one grain of gold and one to two grains of arseniate of soda, after which it is again serviceable within a few minutes.

2. Blisters on the Albumen Surface.—This is a very well-known defect in silver printing. My own experience, and that of others, proves that it is due entirely to drying the albumen, film to too great a degree, the degree of hygro-

scopic moisture, which the raw paper possessed at the moment of its being albumenized, never being taken into sufficient consideration. These blisters may be prevented very well by taking sufficient precautionary measures, as for instance:—

- a. Keeping the albumenized paper in a damp locality.
- b. Moistening the back of the albumenized paper with a damp sponge, which must be, like the water, scrupulously clean.

The paper in the latter case is allowed to become air-dry again before being sensitized. It must neither be wet nor dried by artificial means before it is floated upon the silver solution, and the latter should be strong and fresh enough to coagulate the albumen. Blisters upon albumenized paper are especially rife where alkaline toning and fixing baths are made use of.

3. The Repulsion of the Silver Bath by the albumen film is also obviated by the precautions specified above. It is in the case of a horny and well-dried albumen surface that the repulsion of the silver liquid is most apparent, and in hot weather this disagreeable phenomenon is enough to drive one to distraction, almost. As a matter of course, the defect is apt to appear more frequently in doubly albumenized papers than in those which have received but one coating of the material only. For this reason photographers have recently selected the latter description of paper for portraits, which has, moreover, the advantage of being less costly, a matter of some significance just now when the price of albumenized paper has risen throughout. It is by no means beyond the bounds of possibility that another and better photographic paper may come into commerce shortly, for, among others, experiments made with shellac solution and borax, or phosphate of soda, have not been without some success.

4. Red Streaks in the Toned Pictures, which are at once seen to be due to a thick deposit of albumen, either by draining or dropping, are very rarely formed in good papers, for they only arise when the albumenizer is not skilled in his work; and, as a rule, sheets that have been spoilt in this way are generally sorted out by the seller. Red spots on the albumen arise from soiling it with your fingers, and must not, of course, be put down to the fault of the paper.

5. Marked Colouration of the Silver Bath is caused by certain albumenized papers. If the silver bath is of an alkaline character, or becomes so after long use, this appearance will not be seen in an abnormal condition except when the surface of the paper is constituted of something besides pure albumen—say of a compound of various fatty matters—or contains such substances as gum, gelatine, &c. The best plan to decolourise such a bath is to shake it up with a little kaolin, or to add to it some permanganate of potash until the liquid assumes a rosy tint, when it is allowed to stand for some time, being afterwards filtered.

For filtering silver or gold solutions, as also strong acids and alkalies, the so-called glass-wool (fine glass filter) is to be preferred to paper. A silver bath of normal strength (1:8 or 10) will become discoloured much less readily than a weaker solution.

6. The Discolouration of Sensitized Paper is due, in some measure, to circumstances which have already been cited. If you take care not to exhaust the bath, or to allow it to become alkaline, and to shelter the prepared paper not only from light but also from air, the paper may be preserved for some time without becoming brown. A well sized raw paper generally keeps well.

7. Imperfect Toning of the Prints, and a tendency of the pictures to turn grey, is due, in the main, to employing a weak silver bath.

ABOUT THE WET PROCESS

BY PROFESSOR H. VOGEL.

When we look back at the last ten years or so, and study the progress that has been made in photography, we find that

a great many novelties of various kinds have been made known during the period. Thus we have pigment printing, lichtdruck, photo-lithography, and some improvements in lenses to record; but so far as the negative and positive processes are concerned, everything seems to have remained in *statu quo*. We work now pretty well in the same way as we did ten years ago, and the only progress in this branch consists more in the discovery how to avoid defects, many of which, it is true, we have learnt to overcome. We work, therefore, pretty well as before, but we do not grope about in the dark so much as formerly, because we understand the operations better with which we have to do. The reproach that was once made against photography, that success was due to chance, does not hold good any longer. We can now, so far as concerns the process itself, guarantee the result as much as a sportsman can predict the effect of a shot. To always hit a thing is another matter.

The operations connected with the positive and negative processes are particularly simple; it is the knowledge how to recognise defects and avoid them that is so difficult to acquire. It is against breakers such as these that the amateur is usually shipwrecked; for as amateurs practise the art merely for amusement, they often leave off as soon as this comes to an end, which is always on the appearance of faults and failures.

The professional photographer is, however, bound to breast all difficulties, and must needs give battle for days and weeks, if necessary, to overcome the difficulties in his path. Only recently a singular instance came to my knowledge. In the studio of M. Schaarmachter, of Berlin, there suddenly came a time when the developer ceased to perform its office. The negative fogged in a most determined manner when one proceeded to intensify, and became a positive rather than a negative in the end. Those experienced in the art may remark that such a circumstance as this is not new, but is known to arise when there is not enough acid in the developer, and the addition of this substance would speedily put things straight. But in this case acid was found to be helpless, for the same results were obtained over and over again, and there was no alternative but to fix the negatives first, and intensify them afterwards. It was only some weeks afterwards that the true cause of failure came to light. A little hyposulphite of soda had, in some unaccountable manner, fallen into the stock of sulphate of iron from which the developer was prepared, and the operator on whom the duty of making up the solutions devolved, had not remarked the circumstance. But a very little hyposulphite is necessary in the developer to produce the failure I have alluded to.

Still greater difficulties were met with in another studio here, where reproductions are made, on the occasion of receiving a large supply of Belgian glass. This was offered at a low price, and as many as ten thousand plates were ordered to be supplied. The glass was found to be so impure that, despite treatment with acids, scrubbing, &c., it was impossible to secure a clean surface, and it was settled, as the best plan, to albumenize the plates rather than to attempt to clean them any more. The albumenizing of a glass plate is, however, an operation which, if undertaken in a damp atmosphere, most assuredly brings disagreeable results, and, as luck would have it, the studio in question was very liable to become damp. A continual war had, therefore, to be waged with the bad material, and the operators, you may be sure, were pleased enough when at last there was an end to their enemy.

I may here remark that recently the employment of india-rubber and gutta-percha have both been recommended in lieu of albumen. Many local operators, as also I myself, have tried a covering of rubber with the best success, so I can recommend its use to everyone, and even to those who employ good glass for their work. It is necessary for the photographer to produce his own rubber solution; but this is not difficult to do, and no doubt it will soon be possible to obtain the same in commerce.

If you want to make the solution yourself, dissolve one part of india-rubber in a hundred parts of chloroform. The pure, soft, so-called natural rubber must be chosen, and this is cut into very small pieces. The material takes a long time to dissolve, and the turbid portion is uppermost. The clear liquid should be secured by means of a pipette, and this is then diluted with ten times its volume of a light pure benzole, such as is employed for glove cleaning. Afterwards the solution is filtered twice. In this way a very clear liquid is secured, which will last a long time and work well. An absolutely clear solution is indispensable for working well.

Gutta-percha solution is more easily made. One gramme of gutta-percha is dissolved in ten grammes of chloroform. The solution is rapidly produced, and then the brown fluid is diluted with one thousand cubic centimetres of benzole and filtered. After a short time the filtrate becomes turbid again and milky. It must then be filtered again. Careful filtration is, indeed, the principal thing to be attended to.

The plates to be covered with this material must be acidified, washed, and thoroughly dried. They are then dusted, and coated with benzole solution, as if it were collodion. The superfluous liquid is caught in a separate vessel, and filtered again before use. The plates dry very rapidly, and are capable of employment in a couple of hours; nevertheless it is better for them to remain in a position sheltered from the dust for a dozen hours. They keep good a week.

Sometimes the plates do appear a little grainy, but that does not matter. Before pouring on the collodion the plate is dusted as in the ordinary way.

A photographer of my acquaintance tells me that he has remarked defects in his bath which he believes to be due to benzole. This, however, is highly improbable, for when a plate has stood for a dozen hours there should not be a trace of benzole left, if this is in a pure state. It is, of course, pure benzole that should be employed, and not naphtha. The latter may dissolve rubber more easily, but with the aid of chloroform there is no difficulty in using pure benzole. It is more probable that defects in the bath arise from impure collodion. There are many kinds of collodion in commerce which, besides pyroxiline, contain foreign bodies, of which even the manufacturer himself knows nothing. There is found, for instance, in the preparation of guncotton by the action of sulphuric acid a little xyloidin, nitro-glucose, gum, &c., and these bodies are not to be removed on washing, but remain in the cotton, and being soluble in ether and alcohol come with the collodion into the bath. Every plate that is dipped into the bath increases the quantity of these bodies, and after a time they accumulate in the bath to such a degree that they become injurious, and are the cause of streaks and fog upon the plates.

Camuzet made the proposition some time ago to purify the pyroxiline from the bye-products by precipitating collodion with water, and thus separating the noxious bodies; and precipitated pyroxiline of this kind did actually come into commerce. Unfortunately it was rather dear, but not bad to work with. Recently the purification of the cotton from its bye-products has been effected in a cheaper manner, and the purified materials come into commerce under the name of collodion. I have now employed this material for a couple of years, and I must say that since I have tried it many defects that I used to perceive in my bath have disappeared.

As a matter of course, it is necessary to secure pure ether and alcohol for dissolving the pyroxiline. This is a matter often overlooked. It is not unfrequently the case that photographers procure their alcohol and ether from the first best druggist or apothecary, and the purchase may contain, irrespective of water, a trace of fusel oil, which makes sad havoc in the silver bath; furthermore, ether sometimes contains spirit impurities, which are not less injurious. When impure solvents are employed in the manufacture of collodion, the purest form of collodion is obviously of little use.

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THE DISCOVERER OF THE COLLODION PROCESS.

It is somewhat late in the day to renew the enquiry, "Who discovered the collodion process?" The question has been so fully and so publicly discussed years ago that nothing new remains to be said. The question was reopened, in the columns of a contemporary a few weeks ago by Mr. Sutton, who claims the discovery for the late Mr. Bingham, of Paris, whose acquaintance he made a few months before his death, and to whom he promised at some time to make public the claims in question. If a new claim and a new revelation of evidence were to be made, no one could blame the friendly zeal of Mr. Sutton, even though it involved the maiming of another long-established reputation. But the curious part of the case is, that Mr. Sutton seems to be quite unaware that Mr. Bingham's claims have been published and examined before during his lifetime, and that, unless we are mistaken, he was satisfied with the position in relation to the origin of the collodion process which was awarded to him. We had the pleasure of knowing Mr. Bingham for many years. He generally favoured us with a visit when he was in London, and we invariably visited his studio when we were in Paris. We have had many conversations with him on the origin of the collodion process, and on his early experiments in connection therewith. The extent of the claims now made for him by Mr. Sutton, to the effect that he discovered every step of the process from first to last, certainly transcend those we have ever heard from his own lips. Whether Mr. Sutton misunderstood him, or whether his claims became magnified in his own view, we cannot state. Possibly the latter was not improbable, as the lingering disease which terminated his life produced much debility and prostration of both mind and body for many months prior to his death.

That Mr. Bingham was one of the earliest experimentalists with collodion there is not much room for doubt. He was in the natural position to be the first such experimentalist. An assistant in the laboratory of Faraday, where he came into contact with Schönbein, whose experiments with gun-cotton were first wrought out in this country, he was one of the first who, in this country, saw or made collodion. Being at the same time an ardent photographic experimentalist, and having tried various viscous media for photographic salts, it was very natural that he should early try the new substance which Schönbein's discovery gave to the world. That he did so, but with indifferent success, we have heard from his own lips; but that he discovered every step of the process as Archer published it we never heard him state. The priority of his suggestion, and the circumstances which attended it, we published, on the basis of evidence with which he furnished us, we published

some years ago, and the extent of our claim on his behalf. We had subsequent reason to believe, met with his approval.

The priority to Archer's publication of Le Gray's claim for suggestion is also beyond question, and equally beyond question its vagueness and unpractical character. That he himself had no faith in it is manifested by the fact that as late as 1853, when the collodion process was becoming popular in this country, Le Gray published his conviction that the future of photography rested on the paper process as giving finer negatives than glass. The early experiments of Bingham and Le Gray, both of them photographers of the highest ability, were, so far as they are on record, crude, imperfect, and immature. It was the collodion process, published in a tolerably definite form, of Archer which rapidly gained popularity, and which with comparatively little change, is the collodion process of to-day. To what extent Archer might have been indebted to Mr. Bingham we cannot tell; we never heard Mr. Bingham claim more than the earliest use of collodion. From enquiry amongst intimate contemporaries, we cannot learn that Archer and Bingham ever worked together at all. That Archer was greatly indebted to some of his confrères for aid in working the process to a practical shape there is no doubt Dr. Diamond was one of the most successful of these, and produced presentable pictures by means of the process with which he, in conjunction with Archer, experimented. But none of these things detract from the fact that Archer worked his process into shape; Archer gave it to the public, and with his name it will always be legitimately associated.

ALUM FOR ELIMINATING HYPOSULPHITE.

The plan of using alum for eliminating hyposulphite from prints after fixing, proposed by Mr. Clemons, continues to attract attention in the States. Whilst many speak in the highest terms of its value after test experiments, others complain that it spoils the tone of the prints. It will, doubtless, have a bleaching or reducing action upon the print; but if it be found in practice to have a valuable effect as regards permanency, it would not be difficult to print and tone deep enough to prepare for the reducing effect in the image. It must be borne in mind that as yet but little testing time has elapsed, and that theoretical reasons render the issue doubtful. Mr. C. W. Hearn, writing in the *Photographic Times*, after protesting against the habit of photographers of only half testing new processes by not adhering strictly to instructions, says:—

Mr. Clemons recommends for his directions in using the alum bath the following:—"In the first place, he advises the use of a saturated solution of the alum, and to let the prints remain in two minutes at a time, and then rinse the alum off, and place them in again for three separate times, and then rinse and wash for a minute or so, and mount."

Now you may ask, "What is all this fuss about, and are you (that is me, you know), going to say anything yourself concerning it?" Now this "fuss" is for the purpose of drawing other photographic printers out, and to give the fraternity at large the result of their experiments in this affair, and as to myself, I will simply give the result of a single experiment, which was simply an experiment of permanency of print, more than it was for the beauty of tone.

About the 1st of August, by request of Mr. Clemons, I gave the alum a trial, as follows:—After I had fixed a batch of prints, I took therefrom a couple of cartes de visite, rinsed the superfluous solution from them, and then without any more ado, I placed them in a bath of alum for the space of ten minutes, and then rinsed the alum water off from them, and set them away to dry over night. In the morning I took from the washing tank two other prints, which had been washing all night, and marked on the back of the respective prints the precise manner in which each one was treated, and then tacked the four cartes side by side in a part of the printing-room where

the sunlight falls many hours during the day, and yet, now these prints, after having remained there fully five months, show no indication whatever of the least signs of fading, the alum prints standing the test equally as well as the prints which were washed all night.

Now while my experience does not date further back than the 1st of August, yet I have received letters in which I have been informed that some persons have used it constantly for over a year, and in my next I hope to be able to give other notices of the permanence of the prints which have been subjected to the alum bath. Many photographers cry against the alum destroying the tone of the prints, my experience seconding the same, but Mr. Clemons informs me, in a recent letter regarding it, that he had no difficulty in obtaining fine tones. But knowing nothing further in that line at present, I will not write further about that; but if Mr. Clemons will enlighten the fraternity in that particular, I think that I will speak for them all in saying that he will thereby remove the loudest cry against it. In the meantime, I believe we all, I myself at least, would like to hear from other photographers who have used this alum with or without success, making special reference to the tone, brilliancy, and result of the finished prints treated with the alum bath, for the purpose of eliminating the hypo, and which have undergone but little, if any, washing worthy of mention after fixing.

FRENCH CORRESPONDENCE.

MM. BISSON FRERES, THE WELL-KNOWN PHOTOGRAPHERS—IMPROVEMENTS IN DRY PLATES AND APPARATUS FOR TRAVELLERS—THE EARLY DAYS OF CARBON PHOTOGRAPHY—RECENT IMPROVEMENTS.

SOME days ago I received a visit from M. Bisson jun., whom I had not seen for some considerable time. There is scarcely a reader of the PHOTOGRAPHIC NEWS, I feel assured, who has not heard the name of this skilful photographer, who, since the birth of our art, has always been in the van, so far as regards improvements and progress. Bisson, who for a long time has been associated with his elder brother, acquired a European reputation, in the first instance, by the grandeur of the works he produced, when masters in the art were but few. When the collodion process was first of all practised, MM. Bisson Frères produced pictures a metre long, which were as astonishing to their brethren as they were to the public. After having travelled through Switzerland, and secured views of all kinds, which were not only admired by the traveller, but also much appreciated by scientific men, they had the hardihood to scale the most inaccessible peaks with dark tent and camera, and perform feats which seemed altogether insurmountable. Three times was the ascent of Mont Blanc made, and panoramas produced such as are to be perceived only at that height, together with other clichés of interest taken *en route* between earth and sky.

Later they made, no longer on their own account, but upon that of M. Levy, the well-known stereoscopist, twice successively a voyage to the East, and brought back some charming views of that fairy land that goes under the names of Constantinople, Greece, Egypt, and the Holy Land.

In this early part of their career, in order to render the art more easily applicable in long journeys, &c., MM. Bisson completely modified their methods of operating. A deep study of the albumen process was made, which lends itself better to long voyages, and they made themselves master of all the difficulties that presented themselves. Experience showed them the inconvenience of being encumbered with much baggage, and proved that the travelling photographer should have the most simple apparatus and most simple process to work with.

Having resolved the problem for themselves, M.M. Bisson frères have now the idea of giving the key thereof

to their colleagues, both professional and amateur, offering them plates already prepared, and a travelling apparatus constructed upon the most simple and approved methods. In the visit just paid me, M. Bisson, jun., explained all this, and exhibited some specimen plates which he has prepared, and a model of the apparatus he has invented. The plates shown me were of the most delicate nature, such as only a well-versed practitioner could have secured, and the results are truly marvellous. M. Bisson assures me, too, that they may be employed with great certainty, and without fear of those irregularities in manipulation which often cause so much disappointment to those who employ dry plates purchased in commerce.

As regards the apparatus, I may state frankly that I have never seen anything so simple or perfect in construction. In its *ensemble* it much resembles the scenographe, which I described a short time ago in these columns; but it is seen at once that only a master in the art could have designed so perfect an apparatus as this is. Thus, by way of example, I may say that the frames in which are placed the sensitive plates are veritable masterpieces of adjustment; and, notwithstanding their slightness, two plates find place in every one of them, fixed back to back. They are separated by a thin piece of black cardboard, and to secure two plates it is only necessary to reverse the slide.

There is not a portion of the apparatus which does not work with mathematical accuracy, and yet, despite the fineness of workmanship, the price does not exceed that of the Dubroni plaything which is sold about France to the students and schoolboys.

I shall, of course, give further details about the plates and apparatus on a future occasion, confining myself to this brief description until M. Bisson has definitely concluded the arrangements he is making respecting them with the principle photographic dealers in Paris.

In 1862 when Poitevin put a finishing touch to his process of printing in permanent pigments he announced that his method was now in practical condition, and he was prepared to grant licenses to such professional photographers who might desire to practice the art. There was only one applicant in Paris for permission to work the process, and this was M. Pierre Petit. As soon as he had acquired the right of working the process from Poitevin, Pierre Petit caused to be painted on the walls of his establishment in letters two metres high an announcement which he believed would attract crowds of customers. It was to the following effect:—*Imperishable carbon photographs*. At the same time he actively followed up the lessons given him by the inventor. But Poitevin, to whom photographers owe so many ingenious discoveries, and who knew so many of the theoretical secrets of the art, was himself a very mediocre operator, and could not practice what he preached. Moreover, his method required those improvements and simplifications which only continued practice in the art day after day could bring about, and consequently Pierre Petit was compelled very soon to lay aside his enthusiasm. Again the public did not yet understand what photography in carbon was, and did not therefore bestir themselves to demand those imperishable photographs of which specimens were shown them, specimens which scarcely gave a favourable idea on the subject. Things, therefore, continued on in the same groove, and Pierre Petit, like his neighbours, continued to give his customers portraits, more or less permanent, printed by the aid of silver salts.

Since that time a dozen years have passed away, and, despite the great and persevering efforts that have been made, carbon photographs have remained out in the cold, having failed to make way into our studios. But there is now, we are glad to say, signs of the process reviving, for it is making its appearance in some of the largest of our studios. Among these may be mentioned Pierson et Braun, Franck de Villecholle, Liébert, Walary, Truchelet, &c., all of which have made arrangements for this new

method of printing. In a short time, doubtless, the public, which has now scarcely made up its mind upon the subject, will have nothing more to do with any prints excepting those produced in permanent pigments. For it must be admitted that the portraits which have been in the photographic studios which we have been referred to are far superior to pictures which are produced in the ordinary way by silver printing. Therefore it may be said, without exaggeration, that we are now on the eve of that revolution which has been anticipated for many years past, and I for one am not sorry it is coming to pass.

ERNEST LACAN.

COMETS AND SPOTS.

BY W. J. STILLMAN.

I HAVE been making some studies on comets and specks, in emulsions especially, and find that the worst cases, and a large proportion of all, come from impurities on the plate, either held there by a substratum, or falling on the plate in coating, particles of dust of chemical nature, or impregnated with chemical substances. In wet collodion, it is easy to confuse the effects of particles held in suspension in the developer, which will sometimes cause comets, with other causes of the same defect, because the flow of the developer follows pretty much the same law as that of the collodion, and it is customary to connect the curves of comets or the direction of their flight, with the flow of collodion or developer. If the developer contain particles of any chemical reagent capable of reducing silver from the nitrate, the comet may be due to this—it sometimes is so—but oftener to particles of insoluble matter in the bath solution, resting on the surface of the film and carried by the developer with it. These last are generally very small with short tails. With a carefully filtered bath, and an old developer (several days at least) carefully deposited, there will be no danger of comets from either of these causes, and they are rarely those to which the trouble is due. In dry-plate development, especially, we have nothing to do with developer or bath comets, and yet comets are more common and graver nuisances in dry plates, particularly emulsions, than in wet collodion.

A careful examination of many negatives by different dry plate processes convinces me that the principal or most disastrous cause of comets, opaque specks, &c., is the adhesion of chemical particles to the glass or substratum. If these particles are readily soluble in alcohol and ether, solution takes place at once, and the dissolved chemical follows in a line in the direction of the flow, the action being strongest towards the nucleus of the comet. If there is free silver in the emulsion or the developer, of course there is a line of reduced silver in the negative, if not, and the chemical particle have a reducing power, as, for instance, a particle of carbonate of soda, there is a more energetic reduction as soon as the developer is poured on, with the same result. Sometimes the comets will head in opposite directions, which shows that there were numerous particles both fixed on the plate and lying on it, in the former case the line of dissolved chemical following the flow and leaving the nucleus behind it, and in the latter the nucleus moving on with the wave of collodion, and leaving its track impregnated with its substance.

In using the Liverpool washed emulsion, I have found one lot of plates marked by comets and transparent or opaque spots, and another lot, prepared from the same bottle, perfectly free. When coating them in my room at an hotel, I found them usually very free from specks, so long as I used no substratum; while plates coated in a room used for photographic purposes, or which had been previously coated with albumen in such a room, were liable to all these defects. In these plates, though there is no question of free silver, there is also no chance of washing out the chemical once entangled in the film; and therefore, while comets are very rare, transparent and opaque spots are very common

when the substratum is applied in a room where there are chemicals, especially alkalis—soda, potash, or ashes from the grate—floating in the air. Plates coated with the Liverpool Co.'s emulsion with no substratum, but simply a border of india-rubber, were the most free from specks of all kinds of dry plates I have ever used; while others which had had a coating of albumen applied in a dusty room were the worst marked batch that I have seen in a long dry plate experience. In emulsions in which the silver is not entirely dissolved, and appears in small specks at the bottom of the film, there are, of course, small opaque points, sometimes as comets with short tails, which latter are due to the fact that the solvent power of the emulsion is slightly increased by the evaporation of the ether and a part of the alcohol, so that the particle of silver which resisted the comparatively high solvent begins to dissolve the moment its grade is reduced by evaporation of the ether and alcohol leaving the water in greater proportion.

I was lately called in to advise on the remedy for an occurrence of specks and comets in the Liverpool Co.'s plates, and, after examining emulsion, water, preservative, &c., &c., without finding any fault, I discovered a vessel in the albumenizing room which had been used for soaking spoiled plates to remove the old film, and in which the soda had dried in efflorescent crystals over the edge of the dish, the plates in it, &c., in such a way that the least touch would set afloat small particles of soda which might readily attach themselves to the wet albumenized plate. Soda, and every form of chemical substance not in bottles, was at once banished from the room.

When the spots are transparent the dust attached to the substratum would of course be of such chemical nature as to produce insensitiveness; and this spreads as the plate is kept, so that plates which showed no spots when first prepared would show large disks of insensitiveness with a centre of foreign substance. When plates are thoroughly washed this is washed out, but in lightly washed plates, and especially in the washed emulsions which receive no washing in the film, these spots are exceedingly troublesome unless proper care be taken to avoid dust.

There is a form of spots recognisable enough, and known by all wet collodion workers as the result of too much of some slightly soluble salt in the iodo-bromized collodion, which may be puzzling, when one thinks that the collodion has been thoroughly deposited before using, and that all particles of salt should have gone to the bottom. The reason is, that as the solvents held in solution all the salt they were capable of holding, the moment they begin to evaporate the salt gathers together in minute crystals in the film, and when the plate is dipped in the bath they re-dissolve, impregnating the film for a small distance round with a greater amount of salt than the average film contains, and produce spots of insensitiveness, and transparency in fixation.

Correspondence.

THE "VEXED" QUESTION.

SIR,—The championship of a dying assertion, undertaken by Mr. Sutton in the *British Journal* of January 1st, although bearing testimony to his humanity is not the less extraordinary on account of the total absence of dates, or, indeed, of any single fact connected with the case, except that of extolling the genius of one man by depreciating that of another—certainly a most illogical method of proof. Mr. Sutton bears hard upon Archer and seems to indicate he was ignorant, incipient, and in fact accuses him of every fault a photographer ought not to possess. Wanting a personal knowledge of Archer (which might give rise to partialities) a just decision of his abilities might be grounded upon his published contributions to photography. In the May number of the *Chemist*, 1850, Archer pointed out the energetic qualities of pyrogallio acid. This, in

itself no mean contribution, paved the way for that celebrated article detailing the whole of the collodion process, with but few alterations such as practised to the present day. As I shall have more to say respecting this claim, I merely at present give the date of publication, the March number of the *Chemist*, 1851.

In 1852, Archer published a "Manual of the Collodion Photographic Process," in which was given a more elaborate explanation of the manipulatory details than could be contained in the *Chemist* of 1851, and the directions in the Manual are at once concise and practical, and the book in its simplicity, would hold its own against any treatise of the present day.

The following is a paragraph selected from the Manual, page 23:—"The advantages gained by using a stronger bath of nitrate of silver do not, in my experience, counter-balance the increased expense, I shall therefore give the old proportions thirty grains nitrate of silver to one ounce of water—as being the most economical, and giving the least trouble." After a lapse of twenty-two years from its publication, can the present generation of photographers say much more. This is but one of the practical hints teeming in the "manual," and either Mr. Sutton cannot be aware of the writings of Archer, or his means of information most cruelly misdirected, to apply to the labours of Archer expressions, (even were he living) at once harsh and unjust, but being dead, becoming doubly so.

On comparing the dated publications of Bingham, the communication of Mr. Sutton respecting his (Bingham's) dying asseveration of priority in the collodion, receives a remarkable degree of corroboration. In all, eleven editions of "Binghams Photogenic Manipulations" have been published, the last in the year 1854. On carefully comparing several preceding editions, the practice of the publisher evidently was to issue an edition every year as follows:—seventh, 1850; eighth, 1851; ninth, 1852; &c. If this sequence was always followed, it would carry Bingham's "Manipulations" up to the year 1843. This is, however, begging too much of the question. The only edition I can speak of, is the seventh, 1850, January, in which Bingham, enumerating his experiments, mentions amongst them collodion. The communication is meagre in the extreme; meagre though it be, it is sufficient to indicate that the mention of collodion for photographic use is incontestably due to Bingham.

It, perhaps, is impossible to account for the fact that, as far as known, Bingham never published any protest against the claims of Archer, though during the issue of the last two editions of the "Photogenic Manipulations" the collodion process was rapidly rising into commercial value. In Archer's preface (page 7) to his "Manual" of '52, he observes that G. Le Gray was the first who "alluded" to collodion, and then only "incidentally as a substance that might possibly be made available;" further on remarking "that their experiments [Le Gray's I suppose one of them] produced no result."

To give an idea of what Archer terms "incidentally" and "no result," the following Appendix is copied verbatim from a "Treatise on Paper and Glass, by G. Le Gray," published by Willats, Ironmonger Lane, translated by Cousins, date 1850—one year previous to Archer's publication in the *Chemist*.

Appendix.

I have just discovered a process upon glass by hydrofluoric ether, the fluoride of potassium and soda dissolved in alcohol 40° mixed with ether, and afterwards saturated with collodion. I afterwards react with aceto-nitrate of silver, and thus obtain proofs in the camera in five seconds in shade. I develop the image by a very weak solution of sulphate of iron, and fix with hyposulphite of soda. I hope by this process to arrive at great rapidity. Ammonia and bromide of potassium give great variations of promptitude. As soon as my experiments are complete, I will publish the result in an Appendix. This application upon glass is very easy. The same agents employed with albumen and dextrine give also excellent results, and very quick.

I have also experimented with a mucilage produced by a fucus—a

kind of seaweed—which promises future success. I hope by some of these means to succeed in taking portraits in three or four seconds.

For the credit of the memory of Archer, it is to be sincerely hoped that he never saw the above appendix, as, otherwise it might raise in the mind a painful suspicion of ungenerous repudiation.

For belief in the appendix is not solicited upon the vague assertions of an unknown name, Le Gray's was an established fact in photography, stamped in after years by productions of bold practical originality. Here are given collodion, ether, alcohol, sensitizing salts, developer, and fixing, and the specified times of exposure would credit modern practice.

By what possible arguments, can the advocates of Archer's claim, ignore the above overwhelming proof of Le Gray's priority?

The above date (1850), but represents the translated edition, but so fully convincing is this translated appendix, that any further investigation respecting the date of the original matter was considered useless, though I strenuously oppose Archer's advocated priority, no doubt that with collodion his name will be imperishably connected for his contribution to the *Chemist*, and the issue of his Manual gave such an impulse to photography, that it is felt to the present day. Following is a tabulated view of my idea of the invention:—

Date, 1850, seventh edition of Bingham's manipulations, mentions, amongst the experiments, the use of collodion. Date, 1850, Appendix in Le Gray's work, mentioning everything necessary for a working formula. Date, 1850, Archer's communication respecting the energetic power of pyrogallic. Date, 1851, Archer's communication to the *Chemist* on the collodion process. Date, 1852, issue of the Manual by Archer.

Sedulously in the above, all family affairs have been avoided, trying, if possible, to draw from the data balance some approximate solution of a "vexed" question.—Yours truly,
H. BRUTHER

IN THE MATTER OF SECRET PROCESSES.

In the photographic mind, there is somehow an aversion to the sale of secret processes. Yet why should it be so? if a man can do something you cannot, and is willing to impart to you the knowledge he possesses, manifestly he is entitled to some recompense, no matter if the method be new or old.

The schoolmaster teaches nothing new, and it would be quite as illogical to dispute payment with him because the information he imparts has been previously published, as to quarrel with a process dealer because he points out and proves advantages you hitherto have been ignorant of.

Now as "Senex" quotes "Freely ye have received, freely give." Photographers generally are willing to take and continue to freely receive. But what about the giving? What did Scott Archer receive? An amount less than that since asked for an enamelling process. What did Goddard receive? What did Blair? Blair who did as much for carbon printing as any other known man, and gave his experience freely: why the fraternity gave his survivor a sum I believe under ten pounds. Be it as it may, a couple of thousand pounds will cover all the brotherhood has ever given, out of their wealth, to those poor experimentalists upon whose brain-work their fortunes have been built.

With examples like this before you, photographers have the assurance to point to those whose names are struck off our muster-roll, and barefacedly say to modern experimentalists "Freely give," ought they not rather to hide their heads in shame.

Let him, who next quotes this saying, say what he has received and given, and I do not doubt upon whose side the balance will rest,
W. E. B.

Halifax, January 25th.

[Our correspondent "Senex" must answer for himself, if he think proper, the argument of "W. E. B.," but we may

point out, in the meantime, that the allusions to matters of fact are scarcely accurate. Archer's family received a sum of between seven and eight hundred pounds from photographers, and through their efforts his children received a pension. For Goddard a handsome subscription was raised, and his service to the art was not stupendous. Blair was one of the most capable and efficient of the army of unobtrusive experimentalists who aid in the advancement of the art. The sum contributed was very insignificant, and very much in excess of the amount our correspondent states. There is some confusion in the analogy between the school-master and the secret process vendor. The former undertakes to *teach*, not something that is new, secret, or unpublished; but merely to teach something which being unknown to the pupil he requires the aid of an instructor to acquire. The vendor of a process generally announces it as something new and secret. We do not think there is any legitimate objection to the practice of selling processes when no misstatements are made; but it is important not to confound things which are not similar, and the teacher and the vendor of a secret process are really unlike.—Ed.]

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SIR,—I think you must often wish that so many people who help to fill your valuable correspondence column, were not afflicted with such a mania for grumbling; but as you never do remonstrate, I venture to suggest that you will allow me to see whether, as in most cases, your co-operation will bring any remedy to bear upon the grievance which causes a very large number of your readers to grumble to a very great extent.

With all due respect for the most exalted patrons of our beautiful art, and with the greatest possible contempt for the ignorant, cheap dabblers in photography, I submit that the main body, now numbering some thousands, are silly enough to quietly suffer and endure a state of things unknown to any other class—a state of things which a combined and resolute action would soon remedy.

That the rapid development of photography as a business has produced, in all large towns, a great appreciation of good work, no one will doubt, and, consequently, people with very slender purses resolve to patronize the photographer who produces good work, the result being, that after he has succeeded in obtaining a really good negative, he is rewarded by receiving an order for three copies, unless he is foolish enough to furnish single copies, when the order will extend to one only. Now, out of one hundred such customers ninety will never turn up again, and thus time and labour spent in securing a good artistic negative is almost thrown away; while, in the railway station, perhaps only a few yards off, flourishes a frame full of photographs, some being copied from your carefully executed proofs, with a pleasing intimation that any picture may be copied (?) at the very tempting price of 2s. 6d. per dozen, post free. Granted that the great chiefs of our ever growing army do not feel the grievance, simply because they are enabled to fill the whole of their time with the aristocratic portions of humanity, yet the "main body" does, and I trust you will allow me to suggest that it is composed of a very great number of skilled men. "Artists" whose aim is, equally with their higher placed brethren, to exalt the work and position of photography. Will no one suggest a remedy? Would not the Chancellor of the Exchequer be glad to increase his budget, say by arranging, as with trade marks, that one might voluntarily pay a certain amount for the right to stamp with an agreed mark every picture produced during one year, the right or license to be renewable yearly or otherwise. I think there are hundreds of photographers who would willingly spend yearly a moderate sum to ensure all copies of their negatives being issued from their own establishment, and to be able to take a walk through the railway station of the town, without being faced by one of their best photographs, and the very polite intimation about the 2s. 6d.—I am, sir, yours truly,

J. MACKE WRIGHT.

A PERSONAL EXPLANATION.

SIR,—I venture to ask a small amount of space in your paper in consequence of the very great number of letters I have received since the issue of the ALMANACS, and which are all on the subject of the last three or four years' work in collodio-bromide. Many ask that I should at once publish all the results of my experience, and many go back to the old discussions that took place in 1871.

It will be remembered that in June of that year I read a paper on Collodio-Bromide before the Photographic Society. I proposed a very great difference in the manner of making an emulsion from what any previous writer had done, and I showed on what point previous workers had been in error.

No sooner had my paper appeared than I was instantly attacked, and I was told I was all wrong. Knowing I was right, and feeling the importance of the modification I had proposed, I resolved to submit plates prepared in the manner I proposed to the crucial test of public opinion. How far I succeeded in proving my case may be judged from the fact that all who really understand emulsion work (Canon Beechey, Mr. Stillman, Mr. Mawdsley, Dr. Dawson, Mr. H. Cooper and others) agree with me now, and it would be a bold man who would now propose to make an emulsion with ten grains of silver only to the ounce, or who would attempt to uphold the doctrine laid down by Mr. Carey Lea, previous to the reading of my paper in 1871, that any excess over ten grains was "not only useless but injurious to the emulsion."

Having, then, as I believe, clearly proved my case, I drop commercial photography as far as having any pecuniary interest in it goes, and can answer all the letters by saying that at any time you have any point that my experience may assist to elucidate, I shall be most happy to contribute my mite.

I cannot conclude without thanking the numerous professional and amateur photographers who have helped me with sympathy and advice. I believe that in the ranks of the profession, as well as among amateurs, I have made not a few friends, and if one or two patentees and one or two persons whose trade instincts I have offended have constituted themselves my enemies, and dislike my having written and published all I know, *pro bono publico*, they are, happily, in a very small and powerless minority.—Yours, &c.,

H. STUART WORTLEY.

DALLASTYPE.

DEAR SIR,—I have not had time till now to thank you for your favourable notice of my bijou reproductions of the *Pall Mall Gazette* and *Fun Almanac*. But you have made a mistake in the name you have given the process. The little things were not done by my photo-electric process, which, as you know well, produces an intaglio plate for copper-plate printing—a process I have, much against the grain, long ceased to work. They are done by Dallastype, which is a quicker and cheaper process, intended, as you are also well aware from specimens you have seen from time to time, to produce, as blocks for surface printing and other purposes, enlarged, reduced, or same sized copies of woodcuts, type, or MS. matter, line work in pen-and-ink or pencil, chalkgrain and steel or copper-plate prints, and lithographs in line. This is the process I am making arrangements to divulge to subscribers on easy terms, which will be shortly published.

"While I am on my legs"—or, to be literal, *calamum manu*—I find myself compelled to decline an honour thrust upon me, not without covert sarcasm. An article on the so-called Pretsch process, by Herr Leipold has, been translated in your journal. In that article Herr Leipold describes me as the only disciple of Pretsch, and writes as if Dallastype and Pretsch's process were identical. I am neither Pretsch's "disciple," nor is Dallastype Pretsch's process with another name. It is physically impossible to apply Dallastype to the Pretsch process.

[Mr. Dallas proceeds to refer, at considerable length, to

other articles by Herr Leipold and Herr Scammoni in a Continental journal, in which he revives the old discussion as to the respective claims of himself and Herr Pretsch. Mr. Dallas uses strong language, charging Herr Pretsch with "robbing him of the fruits of his brains"; but as the matter has been discussed before, and has scarcely now even sufficient personal interest for recapitulation, we do not feel justified in filling several columns with its revival. We give the conclusion of his letter, in which he gives his estimate of the value of the process recently described.]

And after all, what is the so-called Pretsch process now worth? Herr Leipold has, I admit, given the most lucid description of it which has yet appeared—more lucid than the inventor's patent. Yet, as I have said, what is it now worth? It is a clumsy, expensive, and roundabout method of photographic engraving. It is a mass of uncertainties and complexities, even on Herr Leipold's own showing. It is not possible to produce by it uniform results, and it requires expensive skilled labour (Herr Leipold says nothing of what the engraver must do) to make its productions presentable works of art of even moderate calibre.—I am, dear sir, yours truly,

DUNCAN C. DALLAS.

362, Gray's Inn Road, London, January 20.

NITRATE OF BARYTA.

SIR,—I do not know whether Mr. Henderson, or any other of your readers who uses nitrate of baryta in the negative bath, has ever observed any peculiarity in the behaviour of that salt, when added to a solution of nitrate of silver.

I have lately been preparing some baths for the coming summer—baths mostly old, which had been neutralized, boiled, or sunned, and filtered, and stored away in a south window during the late autumn and winter. The first, neutralized and boiled, retained its apparent purity, no deposit on the bottle, yet when powdered nitrate of baryta was added to it and well shaken up, in a short time a lavender, or some such tint, was observable, which lasted some hours. The second, neutralized, sunned, and filtered, with a slight deposit on the sides of the bottle, shewed a much deeper stain. This was a new bath last summer, used only once out of doors for a few plates. The third, a remade bath from carbonate of silver, had the faintest discolouration. All these baths, of about 40 oz. each, were originally made with rain-water, collected in the open country in glazed earthenware vessels.

I have used throughout Mr. Henderson's formula; viz., three grains of nitrate of baryta, and after complete dissolution two-thirds of a grain of iodide of potash to each ounce of bath. They are all now clear and bright, but I have not yet tested them. Now, sir, the moral I wish to draw from the above is this: if the lavender, or other tint, indicate the presence of organic matter in baths carefully treated, not over used, apparently pure and which had been working well before being laid aside, it seems to me an additional merit, beyond the great benefit the nitrate of baryta confers in the absence of pinholes and greater sensitiveness and endurance, if it can thus eliminate an hitherto unsuspected evil from the silver bath.

As I am now seeking information, I should be much obliged if Mr. Henderson or others will take the trouble to confirm or refute the observations I now venture to submit to your notice. I may add, the nitrate of baryta was obtained from a well-known chemist, and is, therefore, presumably pure. Your obedient servant,

R. M. S.

FUTURE PRESIDENT OF THE PHOTOGRAPHIC SOCIETY.

SIR,—As one of the founders of the Photographic Society of London, and one of its oldest officers, I have watched with much interest and anxiety its history during the past year. The prospect of renewed peace and prosperity should be very satisfactory to those really concerned about the welfare

of the society. As the confirmation of these prospects must depend very much I think on the choice of officers at the coming election, will you allow me to suggest to those of your readers who are members, that those, most likely to conserve their interests in the future, are those who have served them well in the past. For many years, through a perilous period, Mr. Glaisher proved a highly valuable President, and I believe his restoration to the Presidency would be of the utmost benefit to the Society. It would also be a graceful recognition on the part of members that his good services were remembered, after the bitter feelings of temporary agitation were forgotten.—Your's most truly,

HUGH W. DIAMOND, M.D.

THE FUTURE OF PHOTOGRAPHY.

My DEAR SIR,—Mr. Hooper's paper read at the last meeting contains many valuable suggestions, and points to a very distressing state of affairs in the history of the Photographic Society. A sort of revival is absolutely necessary, and it behoves all concerned to lend a helping hand. I hope that photography is now old enough to do for itself what it has been accustomed to expect from a different source, and unless the profession is made aware of its duties, the decay, now only too apparent, will go on, and there is no saying what may be the ultimate result. In the absence of any generous spirit willing to come forward and expose himself to the insults of the lookers on, we must look for help from the photographic press, and there is now, I think, a capital opportunity for putting practical suggestions to the test. A Royal Charter and Diplomas are visionary expectations. The profession ought to support its own society, and support it liberally. One hundred of its most successful members could easily be found, who might be induced to subscribe five guineas annually, and engage further to pay such subscription for five years. Such an income might, in addition to other sources of revenue, place the Society on a safe footing, and considerably extend its usefulness.

It is much to be regretted that among its attributes the Society has not that of giving its decisions or opinions on matters which concern the art, brought from time to time before the photographic world by its professors; such a course might save much annoyance and ill-feeling to all concerned, and put an end to dirt-throwing, of which there has been a great deal more than is necessary or profitable. The last instance to which I should like to call your especial attention is the "Kennett discussion," when the word "stolen" was persistently repeated. If it has come to pass that all "workers" are to be allowed to use such language towards any one who may bring the result of his labours forward for the benefit of the fraternity I can only predict very disastrous results for all concerned. I can easily understand why the most successful photographers keep to themselves most things which they might otherwise feel inclined to make public for the benefit of others.—Yours very truly,

C. FERRANT.

January 18th.

Proceedings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held at the Memorial Hall on Thursday evening, the 14th inst., Mr. W. T. MABLEY, President, in the chair.

After the routine business, Mr. John Brier, Jun., read a paper entitled "A Few Remarks about Silver Printing" (which will appear in our next), and exhibited a number of prints in illustration.

Mr. BROTHERS, F.R.A.S., said that as photography had been employed in the recent transit of Venus, he thought the members would be glad to know in what way the photographic methods had been made useful; he then, by means of a large number of diagrams, illustrated the whole subject of the transit, and con-

cluded by explaining the application of photography. The diagrams were shown by means of the oxyhydrogen light, the lantern being managed by Mr. Coventry, and Mr. Noton produced the oxygen by means of his apparatus during the lecture.

The meeting, which was very largely attended, concluded with a vote of thanks to each of the gentlemen who had contributed to the evening's proceedings.

Talk in the Studio.

PICTORIAL BACKGROUNDS AND HOW TO PRODUCE THEM.—Mr. Werge has issued in the form of a handy little pamphlet his instructions for the application of the powder process to the production of pictorial effects in portrait negatives; and illustrated his pamphlet with a capital illustration of what may be effected by the method. Many photographers will be glad to possess explicit instructions in such a handy form.

SOMETHING LIKE PHOTOGRAPHY.—Mr. C. Cooke gives in the *Society of Arts Journal* an extract from a back volume of the *Gentleman's Magazine*, which is curiously suggestive of a photographic operation. He says:—"In the *Gentleman's Magazine*, Vol. 38, p. 52, reference was made to a Prince de San Sovero, at Naples, who had learned to give a fixed tint of any colour to white marble, so as to penetrate the mass, irrespective of any thickness, so that the figure of the Virgin, painted on a cube of white marble, two feet square, was impressed on all the leaves sawn from the block. But, prior to 1660, an Englishman named Bird practised this art with success. Several specimens of marble thus coloured were shown to Charles II., and broken in the King's presence, so as to prove such success. In the year 1745 the wife of a stonecutter named Long, at Bow, in Essex, also performed the art with success. At Oxford specimens of the coloured marble were also seen. The plan or recipe was to take two ounces of aquafortis and two ounces aqua regia, of sal ammoniac one ounce, and two drachms of spirits of wine; also two drachms of pure silver, with gold to the value of 4s. 6d., A.D. 1745. The silver having been calcined and placed in a vial the aquafortis was poured upon it. The silver having evaporated, a watery mixture was produced, yielding a blue, and then a black colour. Then the gold was calcined and placed in a vial, and the aqua regia having been poured upon it the mixture was placed aside to evaporate. The spirit of wine was then poured upon the sal ammoniac and allowed to evaporate. The result of the mixture was stated to be a fine golden-coloured water, of divers colours. With these fluids pictures might be painted on soft, white marble, the figure being renewed daily with fresh fluid. Thus a picture, drawn on the surface of the marble, would appear even in its inmost parts."

PHOTO-MECHANICAL PRINTING IN AMERICA.—The American Photo-relief Printing Company recently sent us an example of a monthly magazine, devoted to building subjects, which they illustrate. Some examples of reduced copying produced by photo-lithography were very delicate and perfect. The latter are produced, we understand, by a new transferring method due to Mr. Carbutt, whose name is familiar to our readers.

THE LITHOGRAPHER, a monthly journal devoted to lithography, has just appeared in a new series as the "Printing Times and Lithographer." Those of our readers interested in photo-mechanical printing will find much that is interesting and instructive in this excellent monthly.

To Correspondents.

J. H.—Your enquiry how to make tracing paper for photographic purposes is scarcely sufficiently clear. We do not know of any photographic purpose to which tracing-paper is applied. Ordinary tracing-paper, which is chiefly used by architectural draughtsmen and surveyors for tracing plans, is made by saturating the paper with some kind of varnish, generally a mixture of turpentine and Canada balsam; but it may be purchased of most stationers better than it can be made by a non-expert. It is probable you refer to paper for covering negatives to admit of easy retouching, and ordinary tracing-paper will scarcely be most suitable for such a purpose, as it will not be very easy to work upon its surface with lead-pencil. As you will learn from a recent letter by Mr. Fry, the transparent paper best suited to that purpose may be obtained from Marion and Co., Soho Square.

W. W.—An autotype negative may be used for producing silver prints, the same as any other negative. 2. We cannot speak with certainty of the respective capacities of the two lenses for producing large heads, not having made comparative trial.

A. K. L.—It is somewhat difficult to advise you without knowing whether you have any convertible facilities for improvising a dark room, and also knowing whether it is required for occasional or frequent practice. If for occasional work only, one of the numerous dark tents or dark boxes might be used; if for frequent use, it would be wise to make a frame-work of wood and cover it with a double thickness of black calico. The disadvantage of this would be the tendency of all kinds of fabrics to harbour dust, and the risks which attend dust in a dark room. Can you spare a space in any room which will admit of a wooden partition to make a dark room of four or five feet square. If so, that will undoubtedly be best, and might be easily and inexpensively managed.

JOHN STONE.—Some years ago we had considerable success in electrolyte experiments, but not recently. We regret that we cannot help you in your difficulty, as we do not remember meeting with a similar case.

AMATEUR PHOTOGRAPHER.—Your examples of work are very good—the landscapes especially. The portraits are good, but the lighting is not quite satisfactory, that of the lady especially, in which the face is flat from the use of a direct front light. The greatest defect is the white sky in the unmounted landscape. The snow scenes are effective.

CHRONIDINE.—Much depends on circumstances. The following are good proportions:—Length 26 feet, breadth 12 feet, height at eaves 6 feet, height at ridge 13 or 14 feet; north side and roof 6 or 7 feet opaque at each end, the remainder glass to within 20 inches of the ground; south roof opaque, south side about 10 feet of glass. 2. The lens you mention may be used for cabinets; but if required for full-length figures it would need a small stop. 3. There is no patent, and can be no license; but instructions to work the process, now a secret, will be sold for a price which will be duly published. We fear that the practice of photo-mechanical printing is too limited to induce dealers to keep any extensive stock of such materials, but there should be no difficulty in obtaining them when required.

R. B.—Plain prints may be produced on the unglazed side of albumenized paper; but scarcely so fine as on plain paper properly prepared. The paper should be floated on the ordinary silver bath with the unalbumenized side in contact with the solution. The toning and fixing may be conducted as usual. We have seen very good prints so produced, which answered well for colouring. 2. It is possible, by applying cuttle-fish powder to the face of an albumenized print, to secure a surface upon it to work with crayons.

M. R. L.—There are various modes of ascertaining the equivalent focus of a portrait lens. One of the most simple is that which we proposed many years ago. Take any flat object—say an engraving or diagram—and extend the camera until a perfectly defined image of the precise size of the original is obtained upon the ground glass. Now remove the lens and measure the distance from the ground glass to the object; one-fourth of this distance will represent the equivalent focus of the lens.

G. M.—No report has yet been made.

Y.—It is probable that the process of enamelling prints will tend towards permanency, as it of course protects the image from atmospheric action. Waxing, and treatment with the various encaustic pastes will also tend to protect the image.

PROVINCIAL PHOTOGRAPHER.—If our correspondent who used this signature a fortnight ago will communicate with Mr. R. Passmore, of Swindon, that gentleman will furnish him with some albumen plates which will suit his purpose.

B. A.—The best method of adding intensity to a varnished negative, in our experience, is that which we described many years ago. It consists in treating the negative with tincture of iodine, made by dissolving eight grains of iodine in an ounce of alcohol. First moisten the varnish with plain alcohol, and then apply the tincture of iodine. In a few seconds it will darken the image and produce an olive tint which possesses great printing intensity. Care must be used to stop the action before a yellow tint is acquired, which is less really intense. Rinse with alcohol and dry before a fire.

GUSTAVE MACAIRE.—Many thanks for the excellent specimens and the interesting details in regard to them. The post office order duly received, and the *YEAR-BOOKS*, &c., forwarded. Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

Messrs. CHILDS and HICKS, South Shields,
Two Photographs of Robert Ingham, Esq.

Mr. BENTHAM, Cheltenham,
Two Photographs of Fern Leaf Borders.

Mr. R. DIGHTON, Cheltenham,
Two Photographs of Bishop of St. David's.

Mr. A. KNIGHTON, Kettering,
Two Photographs of Raund's Wesleyan Chapel.
Photograph of Industrial Exhibition at Kettering.

The Photographic News, February 5, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

IN MEMORIAM.

THE death of our old friend Oscar Gustav Rejlander leaves a gaping chasm in our midst, to be felt for many a year to come. His artistic productions were everywhere so well known and appreciated that his loss as an art photographer is great indeed. Those who denied that photographs could be works of art were bound to modify their statement considerably when the charming productions of Rejlander were placed before them, for he was one of those who strove his hardest to prove the claims of art photography. If he was not successful from a worldly point of view, he certainly deserved to be; but he was too deeply wrapt up in the pursuit he loved so well to give much attention to aught else. It is surprising, too, how little credit he obtained from those outside the profession, for most people used to attribute his masterly sketches to good luck rather than to genius. "By Jove! what a pretty model that is!" was a remark often to be heard from people examining his fine studies; and it was only after a dozen pictures or so, all of them beautiful of their kind, had been inspected, that one began to think that perhaps something else besides inordinate good luck had to do with their production. How many times he made essays before he was satisfied, and how long he had to wait sometimes before he could secure a model proper to his purpose, is known to most of his brethren. Rejlander used to compare photography and painting to steamers and sailing vessels, and would argue that by means of the camera an artist could get more quickly to his destination and secure his result more rapidly than by the brush. Nevertheless, he said, the work was not done so quickly as some people believed, and study and thought were just as necessary with photography in carrying out any preconceived idea. Rejlander never pressed forward his claims to be a great photographer; he modestly allowed his works to speak for him. Indeed, his calm disregard of everything but his art cost him much substantial loss, for his pictures were copied, and his ideas made use of by publishers and others, without permission or acknowledgment. How often have we not seen the pictures which he imagined and photographed, reproduced in illustrated periodicals? And yet it would surprise us to learn that Rejlander ever received a penny from this source. Of course, if the originals had been paintings it would have been otherwise; but being only photographs, who would ever think of paying for them? Indeed the photographer should rather feel honoured in the matter, by seeing his works noticed. And so, perhaps, he might have done sometimes, had his name been attached to the pictures. Poor Rejlander's works were admired and praised by all: by the ragged and penniless gathered round a window in the Strand (where his works were generally to be seen); by the Heir Apparent to the Throne, who asked permission to carry home the artist's own album, that he might have a better look at it; by his brother photographers, who crowded round his portfolio to see the latest efforts of their master. He had always something to show or something to explain, for he never held back experience or advice where he thought they would be welcome. He received homage from all, but he gained little else. He would take a cherished picture away with him—one that had been lauded on every hand—and seek a market for it. He had spent weeks, perhaps months, in its perfection, in the hope that it would command a sale with the public. But his experience was usually the same. "How pretty! How exquisite that face is! Yes, I certainly think that picture would be saleable. You must cut out just the middle—the bust, you know—and mount it on a card, and then it will sell for a shilling." That was "usually the hope held out to him after making some great effort, and accomplish-

ing something which secured the universal approbation. Fortunately O. G. R., as he was familiarly called by his friends, cared little for worldly comforts, and he was too good a philosopher to be always grieving. He had done his best, he knew; he could do no more. He might have made money, no doubt, had he wished it, but it would have been at the sacrifice of what he conceived to be true art. He could not serve two masters, so he chose the latter, and lived on as he best could with the little that fell to his lot. Some thought him improvident, and careless of his means; and so he might have been, had the good-natured fellow possessed any wealth to squander. One of the last acts of his life will best illustrate his warm-hearted and kindly disposition. He desired much to help the Photographers' Benevolent Association, but this it was altogether out of his power to do in the form of a donation; so he went home and made a selection of the charming studies we all of us know so well, and packed them up to be forwarded to the Secretary. He knew what it was to struggle through life, and his last desire was to aid others in making that struggle an easier one.

THE PRACTICAL PRINTER IN AMERICA.

XVII.—Continued.

THERE are other ways, however, to improve such a negative, and which are more or less dependent upon each other to produce the proper result. In place of shading the print after it is taken off the printing-frame, it can, if you choose, be done while printing, by shading the shadows of the negative with a cloth while the lights are printing. In the sunlight the cloth should always be in motion; in the shade, however, if the cloth is moved a trifle every minute or two, that will be sufficient. It is sometimes better to do the shading in this manner than in any other, when a bolder print is required than what would be obtained by shading it after it is taken from the frame. Sometimes when the shadows are very heavy, and get printed long before the lights get done, it will not then always answer our purpose to take the print off and shade it in the manner first described under the heading of this chapter, because it will often give a flat appearance, shade it as little as we choose, and instead of improving it, the contrary effect will be the result. This shows, then, that the lights need to be printed for awhile after the shadows are done, before we think of shading or tinting them by exposure to the light, and to tell when we have obtained a negative that needs this is our next object.

I will suppose we have a very intense negative, in which an attempt at shadow effects has been made, and violent contrasts have been produced. The subject is a lady who has gone too far away for another sitting, and the photographs are to be sent to her by mail, and as this is the only negative of her, it must be printed after it is retouched, which latter process makes it still more intense. The printer here, then, has a difficult task to make a dozen prints from that negative, and upon making a proof of it, finds, as he expected, that the shadows are done a long time before the high-lights or lighter side of the face, and having removed the proof from the printing-frame when the shadow side of the face is done, he can then expose the lighted side for two or three seconds in the strong sunlight, as has been described above. After he has exposed this lighted side, he takes it in, and immediately notices that the side is no longer white, but is decidedly flat, being all over alike from the top of the forehead down to the chin. There is then some detail wanted to be printed in on that side of the face, so as to prevent flatness, before we shade or tint the side by exposure to the sunlight. How can it be obtained?

There are several ways to do this, which we will here describe, showing the advantages and disadvantages of each. We might shade the shadow side of the face, by moving a cloth over the dark side of it while printing in

the direct rays of the sun, or by moving it once or twice every minute or two, if printed in diffused light.

Before proceeding further, I will here mention that we are supposed to be using the pink paper, silvered only a few seconds on a weak bath, fumed a few minutes, and then thoroughly dried.

In reference to the method last described, the results are often unsatisfactory, while the disadvantages are many, viz.:—1st. It is a tedious operation when the lighted side has to be printed considerably. 2nd. There is great danger of shading the background, drapery, &c., which will (especially when it takes so long a time to accomplish it) show badly, on account of the different depths of printing there is to them. 3rd. Every print you make will have to be printed with all of this trouble, and by the waste of much valuable time.

Our next object, then, is to obtain a better way to do this, which will have the advantage of being more easily and better done. There is a comparatively simple method, and we will try it. Instead of shading the shadow side when done, we will simply apply some transparent colour to the back of the negative, exactly behind the shadows, so that while the lights are printing, the said shadows will print slower. By regulating the thickness of the colour on the back of the negative, we can make the shadows print about as we wish. Apply until you get it at the proper thickness or density, which is readily determined by printing a proof of it, with a single tissue-paper placed over the printing-board. The tissue-paper will, to be sure, make the negative print slower, but it will print better, for this colour will more than counterbalance that which we may lose by the use of the tissue-paper.

When this colour is applied as it should be, you will then see that by the time the shadows are done, the lights will have enough detail in many places to warrant you to remove the print from the frame, and tint the lighted side, as has been described.

Upon looking now at the print, you will readily perceive at a glance that the side of the face of the lady's photograph is no longer flat, but there is a boldness, yet softness, to the whole. The detail which was printed in on the lighted side of the face was a little over the temple, and considerably more on the upper, middle, and lower parts of the cheeks. This is what gives form to the side of the face, and is just what was needed. Properly silvered pink paper, and a little judicious shading after printing, gave us a nice bold yet soft print, full of detail, which we secured even in the deep shades, from a harsh negative, by proper masking or painting of the shadows.

Another way to print this negative would be to place it up against the window-glass, varnished side next to it, and lay a piece of tissue-paper on the back part of it, and with a lead-pencil mark on the paper just on the edges of the deep shadows which you wish to print slower. Now cut this paper out, and place it on the back of the negative exactly behind where the deep shadows are, and then place the negative out to print, after having placed another tissue-paper over the whole. In placing this paper on the back of the negative, raise the edges of it a trifle, so that it will not lay flat on the glass, and cause the edges of it to print.

Negatives which have either some transparent colour or tissue-paper placed on the back of them should always be placed, face up, to the strongest light, so that the places which are intended to be shaded will be so, for very often if you lay the board down flat the strongest light striking the negative obliquely, the thickness of the glass will cause the colour or paper to shade a different place than that which you intend it to do. This is especially the case when the place to be shaded is a small one.

The hands and arms, shadows under the eyebrows, shadows in the cheeks, shadows under the nose, the chin, the shaded ear, neck, &c., can very often be improved by either of the last two mentioned ways, viz., transparent

colour or tissue-paper, sometimes one, and often the other, answering the better of the two. Do not carry either to excess, however, for the shadows need only to be softened more or less according to circumstances, and not entirely removed.

The transparent colour is really a good thing, as the following instance, out of a very great many that have come under my observation, will testify:—Miss Hattie W.'s negative is a "shadow" one, and she wants it printed in a vignette, but the lighted side does not, when the shadows are printed, possess sufficient detail unless we make use of this colour. As the prints from this negative are like the ones described last, we will have to blue-paint three-quarters of the whole face, which can very easily be done, and thus allow good prints to be obtained from it, which, if we did not blue-paint it or fix in some way, we would have a very black shadow, which would greatly mar the beauty of the picture.

Sometimes two or three pieces of tissue-paper, cut to the size of the dark side of the face, and pasted (by touching the centre of each piece with a little starch) on the back of the negative, will answer very well.

An excellent way to print the negative, when it is to be printed either plain or in the medallion style, is to take a magnifying-glass—the so-called "sun-glass"—which has a diameter of about three inches, and by means of it to print up the intense parts of the negative, being careful, however, that you do not draw the light to a focus on the negative, for then you will both spoil the negative and print. We very frequently use the glass for such negatives, and also for printing detail in white dresses, &c.

For intense negatives, then, we can sum up the following remarks for their improvement in printing:—1st. Pink paper should be silvered on a moderately weak bath, for a comparatively short time to what it is when prepared for weak negatives. 2nd. The paper should be fumed only a few minutes. 3rd. The negative should be printed as quickly as possible, which can be done by placing it in the strongest sunlight, with nothing over it, providing the quality of the glass, &c., permits. 4th. Soften the too deep shadows of the negative with some transparent colour, and thus permit the lights to print longer. Print such negatives under tissue-paper. 5th. Print until there is some detail in the lights, taking care that the shadows do not overprint. 6th. After removing the print from the board, soften the blank whites of the face, light dresses, &c., by exposure to the light, protecting the rest of the print by some opaque paper, as has minutely been described above. 7th. Sometimes the whole print can be held out a few seconds with fine results. 8th. If the places to be tinted by exposure to the light are large, such as a side of the face, there will have to be some detail printed in on that side or place, as the case may be, before the print is removed from the printing-frame, so as to prevent flatness. 9th. By the use of a common magnifying or sun glass, the lights of the face, hands, &c., can be printed quickly and well. 10th. Study how to improve the prints in printing the order from a negative, and you will not fail to do something towards raising the standard of your work.

A FEW REMARKS ABOUT SILVER PRINTING.

BY J. BAILEY, JUNR.*

I PROMISED this paper at our last meeting, not that I had anything new to communicate, but hoping that the little experience I have had might help those who only print occasionally, and so have time to forget how deep to print and how far to tone and fix.

Though the quality of negative is of the first importance to ensure a good print, it is not of much use discussing what that quality should be when the negative is varnished

* A communication to the Manchester Photographic Society.

and we have it to print and make the best prints possible. First, a few words about the paper: the double albumenised I have only used once, and do not intend to have any more. It gives very brilliant prints, warm tones, and is very liable to blistering, cracking, and fading. Ordinary Rives paper prints very brilliantly, and gives good tones easily, but is very liable to blister, and is not suited for printing from negatives at all under-exposed (dry-plate workers will know what I mean). I use it for weak, full-of-detail negatives and copies, but for regular printing from negatives with proper and too much contrast I prefer the thick Saxe-paper, which seems to hold the fine light shades better during toning and fixing. I keep the paper flat and soft between two sheets of millboard in a bedroom which never has a fire in it.

The silver bath I use is forty grains to the ounce with nothing added, and though ten grains either way does not make much difference, I would rather have it weaker than stronger. I keep it clear by stirring it up with China clay every time it has been used; if this be neglected, the next paper floated on it will refuse to tone well, and make mealy prints. I have used everything known to clear the bath, but have found nothing so successful and unaccompanied by trouble as the kaolin, followed by settling and filtration, which I effect through a quart wine-bottle with the bottom knocked out, inverted, and the neck plugged with wet gun-cotton, which lasts indefinitely. In floating the paper I have a light at the other side of the dish, and by laying a near corner of the sheet down first I can see through the paper as it is lowered that there are no bubbles, with which I am never troubled.

In summer I float the paper two minutes, draw it slowly from the solution and once over a long quarter-inch glass rod, hang it by a clip for ten or fifteen minutes, and dry off quickly and thoroughly by exposing the back of the paper to a fire. When all the paper is dry it is put in the cellar for five or ten minutes to damp, without which it would cockle in the frames and print badly.

In winter the paper should be floated longer, as short floating makes brilliant prints, and long floating soft ones. A strong silver bath also makes brilliant, easy-to-tone prints, and a weak one softer prints, more inclined to mealiness. The time between floating and drying has the same effect; for a paper dried too quickly is insensitive and prints brilliantly, while one dried spontaneously prints quickly and flat, and the longer the paper is wet the more metallic spots appear. In putting the paper in the frame care should be taken to dust the negative, and place any metal spot in the paper over a deep shadow; the pads and back are put on, but the springs not closed till all the frames are full. I use a pad of thick woollen cloth covered with paper saturated with a thirty-grain solution of soda carbonate, and dried. The weak negatives are printed in a weak light, either by covering with tissue-paper or placing them a long distance from the window. The good negatives are put where the best diffused light can get at them, and I have a few under-exposed ones which need the sun to make good prints, always remembering that by printing quickly a warm tone is easily obtained, and *vice versa*.

The judgment of depth of printing does not give me much trouble, though I make a good proportion of overdone prints through not being able to stay with the frames. I have seen it recommended to judge of the bronzing of the deep shades, but that merely indicates a strong silver bath. I judge principally by the lights and partly by the general appearance. The print should be about a third darker than it is to remain when finished, but this depends much on light, paper, and chemicals. I like to finish a lot of prints within two days from sensitising—not that the paper discolours, but, if kept long, the metal spots seem to delight in appearing in the skies on one's most perfect pieces of paper, and this is the greatest objection to the otherwise successful methods of keeping sensitive paper white.

Suppose, now, we have a lot of prints to finish. Wash

them in two dishes of water, and save it for the silver, and then wash ten or fifteen minutes in running water. I use the final washing trough for this purpose. The toning solution is the acetate bath of one grain of chloride of gold in solution and thirty grains of acetate of soda in ten ounces of distilled water. The gold must not be very acid, and it should be added to the acetate solution at least a day before use; but if you have forgotten the gold until the prints are ready for toning, then boil the gold in a test-tube with a little powdered chalk and a few grains of acetate of soda, and add to the bath. My practice is to add to the above half-a-grain of chloride of gold for every sheet of paper to be toned, and I make the addition when the paper is sensitised.

Now, having the untuned prints in a dish of water alongside the dish of toning solution, have a gas flame at the side of the toning dish farthest from you, and let the light be so shaded that it falls on the prints, but not on the eye, or you will soon have partial colour-blindness. The eye and flame should each be about eighteen inches from centre of dish, and about two feet from one another. Now immerse the prints one by one, and do not have above six small or two large prints in at once; turn them over and over till they begin to tone, and always lift in such a manner that the reddest end of the print is in the solution the longest time.

The toning is always first visible in the lights and light tones. In the case of landscapes the distance for the sky printed quickly from a thin negative is always of so warm a tone that it looks red in the gold solution. The toning will be about right when the print looks as it should do when finished at the near end of the dish; but if pushed nearer the light or taken into daylight it will look nearly as red as ever. Now put it back in the dish of water and agitate well, not with the fingers only, but with the flat of the hand, as if slapping something. I used to get very good tones by reddening the prints with salt water before toning, but it retarded that operation very much; I now get the same effect by salting after toning, but the tone must be carried a trifle deeper, as in this case they do not tone any more in the hypo., though it blackens the prints a little by dissolving out more or less of the red organic silver compound, according to the strength of hypo. and time of immersion in it. If the salt be not used after toning, the prints must be very thoroughly washed before fixing, for which I use three ounces of sodic hyposulphite to a pint of water for every sheet of paper to be fixed. Two or three years since I used only two ounces to the pint, and the prints have not shown the faintest trace of fading, discolouration, or imperfect fixation yet; but I use the stronger solution to save time. The prints are not allowed to rest in the hypo., but are lifted up, drained, and immersed, one after the other, as quickly as possible. The time of immersion varies from ten minutes to not more than twenty. If a print be dark in tone it is removed before those of a warmer tone, for the longer a print is fixed the blacker the tone will be. Fixing by artificial light makes the prints more permanent, and enables one to remove them from the bath before the tone gets too black after fixing.

I wash rapidly in three or four dishes of water, and after that for twelve hours in running water, for which I have a black-varnished, wooden trough about sixteen inches long, eleven wide, and three or four deep. One end is aslant, like the bow of a punt, and the water spreads itself by falling on this, moving the prints in such a manner that they somehow wriggle their tails, swim up to the water supply, and seldom go against the zinc grid at the bottom end of the dish, which is about half-an-inch lower than the inlet end. I can wash two dozen 12 by 10 prints at once with this contrivance. When sufficiently washed they are rinsed in a dish of filtered water, drawn over a glass rod, and put between clean calico cloths to dry. I do not believe in blotting-paper, as it cannot be washed.

Prints ought never to be mounted on white boards, as the light and delicate tones are not shown to such advantage as on a tinted mount. If a picture have not sufficient light in itself its absence will be more conspicuous by a surrounding of white, and there is more chance of white card containing injurious chemicals.

The tone of prints for framing and glazing should always be warmer and lighter printed than those to be mounted only. I have framed prints that were nearly red, but when under glass they looked a dark purple. Prints from under-exposed negatives should never have a dark tone, as it makes them look heavy; but a good black tone improves a flat subject wonderfully, and it is always easily got on prints produced in a weak light.

For mounting I use a mixture of fish glue and starch. The gelatine is first swollen, then dissolved by warming, and the starch, mixed with a little water, is added, and the whole boiled well. I consider this superior to glue or starch alone.

I have not practised photography long enough to have any faded prints; the only ones which have discoloured are my very early attempts, or bad ones not worth much care in finishing. I think a carefully-finished print tolerably permanent if it be kept dry and out of the reach of acid or sulphurous fumes. I have found that the iodine method of removing hypo. reduces the print, and lead salts spoil the tone, so water will have to serve till there is something better found. I used to sponge my prints, and so wash them quickly and thoroughly with very little water, but the labour is too great if you have many prints, though if one or two are wanted quickly nothing is better. The washing water should never be warm—say not above 70° Fahrenheit.

REFRACTION OF LIGHT MECHANICALLY ILLUSTRATED.*

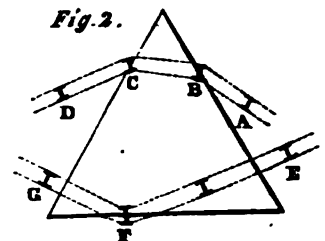
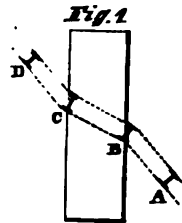
BY EDWARD B. TYLOR.

In preparing an elementary lecture on light, intended to be given at the Taunton College School, I have had to consider how best to explain the somewhat abstruse principle of optical refraction. It is true that Sir John Herschel, in the sixth of his "Familiar Lectures on Scientific Subjects," giving the explanation of refraction on the undulatory theory, describes it as being "exceedingly simple." The fact is, however, that it involves conceptions of wave-motion, difficult for any but advanced students, and even they feel grateful to the eminent physicist for the help afforded by a familiar illustration with which he follows it. He desires his readers to imagine a line of soldiers marching across a tract of country divided at a straight boundary into two regions, the one level ground suited for marching, the other rough and difficult to walk over. Now if the line of soldiers march with their line of front oblique to the boundary, the men on the side just engaged in the heavy ground will be retarded as soon as they cross into it, so that if the line be kept unbroken, the consequence must be a change of front, which will leave the whole body of men marching across the heavy ground in a new direction—in a word, their direction of march will have been refracted. Now the light-waves emitted from a radiant point being compared to the circles spreading from a stone thrown into a pond, it is easily understood how a sensibly straight portion of such a light-wave, passing obliquely from one medium to another of different resistance, will be refracted in a new direction. This simple conception of change of front is at once apprehended by the learner, to whom refraction thenceforth ceases to be a molecular mystery, and becomes an intelligible mechanical act dependent on the resistance of the two media and the form of their limiting surface. Probably no point in all Herschel's lectures has fixed itself in the memory of so many intelligent readers.

In following up the train of thought started by Sir John

Herschel's comparison, it occurred to me that an instrument made to perform refraction mechanically would be useful in teaching optics, and that such a contrivance would only require a pair of wheels running on a table, into and out of a resisting medium. After a number of trials, made with the help of Mr. R. Knight, a simple arrangement has been completed, which answers satisfactorily in showing the behaviour of a ray of light under the various circumstances of ordinary refraction. Pieces of a thick piled velvety plush known as "imitation sealskin" are cut out to represent the sections of a thick plate, a prism, a convex and a concave lens, and glued on to smooth boards. The runner consists of a pair of boxwood wheels mounted loosely on a stout iron axle, and is trundled across the board, or, still better, the board itself is tilted up, and the runner let go in the proper starting direction. The following figures show the path of the wheels, always from right to left of the page.

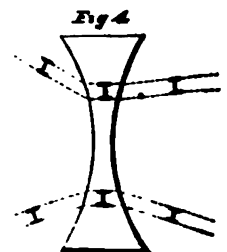
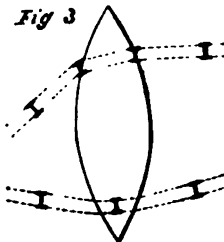
In fig. 1 the runner starting from A enters the rectangle of velvet at B, where, its left wheel being first retarded, it shifts round into the direction B C, till it reaches C, where the left wheel first emerging gains on the right, so as to bring back the runner to the ultimate direction C D. This



illustrates the refraction of a ray of light in entering and quitting parallel plane surfaces of a resisting medium, such as a plate of glass. When the runner enters at right angles to the boundary, its direction is, of course, unchanged, as with the ray of light.

Fig. 2 shows the path (ABCD) of the runner across a triangle, corresponding with the course of a ray traversing a prism. Also, by causing the runner to enter at about a right angle near E, a direction is given to it which, if the surface of the board and the triangle were similar as to resistance, would make it emerge near F, at a small angle to the side. But the left wheel passing on to the smooth surface gains so much on the right wheel, still in the velvet, that the axle slews round, the left wheel re-enters the velvet, and the runner goes off in the direction FG, thus illustrating the total reflection which takes place when a ray of light is directed to emerge very obliquely from a more into a less resisting medium, as from a glass prism, or a surface of water, into air.

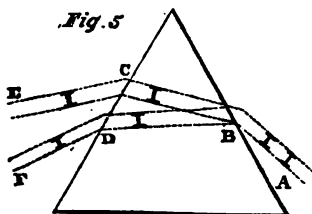
The action of the double-convex lens in causing parallel or divergent rays to converge, is shown by the path of the runner in fig. 3, which requires no further explanation; nor does that corresponding to the divergent action of



the double-concave lens (fig. 4). By starting two runners at once from the right-hand side of the board, so as to traverse the upper and lower parts of the convex lens, they are made to run into one another, thus illustrating the meeting of rays in a focus.

Lastly, by using two runners with wheels of different

diameters, as the refraction depends on the resistance to the wheels by the velvet, the apparatus may be so inclined as to show plainly their consequent difference of refractive



angles. The courses of the two are seen in fig. 5. This experiment, however, requires some nicety of arrangement.

Now the separation of rays of different refrangibilities by a prism being due to a like cause, this experiment serves to illustrate mechanically the decomposition of white light. Let the large-wheeled runner represent the red ray, and the small-wheeled runner the violet ray, the principle of the prismatic spectrum becomes at once evident.

For the information of any who may wish to reproduce this simple apparatus, I may state the dimensions I have found convenient. The wheels may be $1\frac{1}{2}$ in. and 2 in., with rounded edges, mounted on a nearly half-inch iron axle, turned down to $\frac{1}{4}$ in. at the ends. The boards may be 2 ft. 6 in. by 1 ft. 6 in., with velvet on each side. It is convenient to place the velvet nearer to one end of the board to leave room at the other for starting the runner; and care must be taken to cut the velvet so as to present a good resisting surface, as this varies with the direction of the pile. In using the apparatus for teaching, care in manipulation is required to neutralise the defects of the texture. Some kinds of "Utrecht velvet," to be had from the upholsterers, are more uniform than the "imitation seal-skin," and thus work more equally, but their effect is not so striking. Wet sand will answer equally well with the velvet, if metal wheels be used.

Recent Patents.

CHROMO-PHOTOGRAPHY.

BY WILLIAM M'CRAW.

The following specification of a method of producing various novel effects in photography was completed some time since, but its publication in our columns has been delayed:—

"This invention relates to the production of chromo-photographs by the combined processes of printing, colouring, and transferring—in other words, to the making of pictures combining the fidelity of the photograph with the character, quality, and appearance of an artistic painting in oil colours, and that with the facilities of production of ordinary photography.

"In carrying out my invention I use ordinary negatives, but I do not use ordinary paper prints.

"*The Printing.*—I proceed in the first place to produce a print or copy from a negative that is independent of or that can be separated from the glass or paper or other temporary support necessary to its formation. For this purpose I coat one side of a glass plate with collodio-chloride of silver, having a good body of collodion, and having dried and fumed the surface with ammonia I print strongly and tone the image, if necessary, with solutions of all or any or either of the chlorides of gold, platinum, and sodium. With these three the operator, with a little practice, can produce a picture of almost any tone or colour, red, blue, or yellow, or combinations of them.

"To describe another suitable method:—I coat a plate of glass with plain collodion, and immerse in water for some minutes; I then pour over this wet surface a mixture of honey, albumen, and saturated solution of bichromate of potash in water, about equal parts of each, or I use other well-known substitutes, such as sugar, gum, and bichromate of ammonia. This prepared plate is dried at the fire in darkness, and after exposure to light under a positive photograph colour in powder is applied with a soft brush to

develop the picture. It is now immersed in water, slightly acidulated with sulphuric acid, or a few drops of strong ammonia in the water serve the same purpose of clearing away the yellow chromate. This picture when dry is ready for the next process. For pictures of this kind, instead of using a negative, I employ a positive, or print from a negative obtained with collodio-chloride of silver, as already described.

"There are many other well-known methods or processes for producing prints suitable for this purpose, namely, the ordinary photographic collodion processes, wet or dry, including enlargements by the camera, the carbon process, the Woodbury process, or by any other method by which a photographic copy can be made that has the same or a similar appearance on either side when produced upon glass. Having obtained the print on glass I proceed to the

"*Painting.*—I use the artist's oil colours mixed with Japan gold size, or other quick driers for saving time. I can also use water colours to begin with, as in the case of a portrait, for colouring the lips, articles of jewellery, or for remedying spots or defects, as this can be dried at once. I then paint over the whole with the appropriate local colours of the parts, and the painting may be completed at once. It must be understood that the effect is to be observed from the other side, which can be readily done when the picture is on glass. After a little practice, however, in this way some of my assistants prefer to apply the colour to the film photograph supported on paper and removed from the glass by pasting white paper on the film, using starch, sugar, or gelatine, or a mixture of these in water. This is allowed to dry, and can readily be removed from the glass at any time by slightly moistening it again. This has the advantage, with others to be after noted, of giving the picture in its true relative positions when finished in the case of direct prints on glass from negatives being used.

"*Transferring.*—The picture when dry is ready to be transferred to canvas, or any other suitable surface or material, and is, in fact, precisely in the condition of a picture ready to be lined, which is an ordinary operation of the picture liner. I smear the painted surface as well as the surface of the canvas with what is known to picture liners as lining paste (a mixture of glue and flour and Venice turpentine), the two pasted surfaces being pressed together. The excess of paste is expelled by passing over it a smoothing iron heated to about 130° , and soon after the picture readily parts from the glass. It may be remarked that if the picture be removed from the glass whilst still warm and moist, a duller surface is got than when the picture is not detached for a day or two, when it then receives or partakes of the quality of the surface or its support, whether dull or polished. For the sake of clearness I have hitherto spoken only of painting the film as still adhering to glass; but in many cases it is an advantage to use the paper supported film for painting on, as in the case of transferring the picture to a rigid surface, such as a panel; and it becomes very important, when a number of copies of the same subject is required, as in the case of reproducing works of art, as the colours can then be applied by chromo-lithography or other known mechanical means, and when the picture has been trimmed at the edges and transferred with the painted side down, as already explained, to paper, cardboard, or other permanent support, the paper temporarily covering the picture is easily removed by passing over it a sponge dipped in tepid water.

"By another application of the same principle I can produce vitrified enamel chromo-photographs. In carrying out this part of my invention I produce a vitreifiable film photograph by either of the well-known methods known severally as Grune's method and the dusting-on process. I now cut from a large globe of blown, thin, soft glass a piece of the required size and shape; I cover the convex side with this film, and after filling up the concave with stucco, I subject this to heat in the muffle of an enameller's furnace. When cool, I paint this picture with appropriate enamel colours, and again fire. This thin glass, bearing the painted picture, is returned to the muffle picture side down, and allowed to fall over a white enamel surface prepared to receive it. The edges can now be grooved and polished to fit any setting.

"Having thus described the nature of my invention, and the manner of carrying the same into effect, I would observe that I do not confine myself to the precise details herein described, as they may be modified as circumstances may require; but what I claim as novel, and I desire to be secured to me by the hereinbefore in part recited Letters Patent is, the production of chromo-photographs by introducing colours between the photograph and its support, such photographs being embodied in a transferable transparent film or medium, the support being opaque."

The Photographic News.

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ELECTION OF OFFICERS IN THE PHOTOGRAPHIC SOCIETY.

WHEN during the American war the subject of the coming Presidential election was engaging public attention, Abraham Lincoln suggested the impolicy of unnecessary change in the executive during a time of such national disturbance, and gave point to his advice by relating an anecdote illustrating the impolicy of "swapping horses whilst crossing a stream." The Photographic Society has been experiencing something of this impolicy. It has had occasion, unfortunately, to change some portion of its executive at the very time it was modifying its constitution, its laws, and its mode of action. The best of intentions and the greatest ability will not always compensate for lack of experience. The preparation and issue of voting papers is a proceeding entirely novel, and neither precedent nor definite instructions existed as a precise guide. There are exceptional conditions that need special explanation, which is lacking. And in relation to those papers sent out, we have had many letters, some making complaint and protest, more asking for explanations. The voting papers are, unfortunately, scarcely sufficiently explanatory. The instructions do not make it clear that a complete staff of officers require electing on the present occasion; and if the member refer to the law touching election of officers for guidance, he will find that, according to law, nine new officers only are required annually; namely, president, one vice-president, a treasurer, and six members of council. On this occasion, as all officers retire, all the places must be refilled. All members are therefore at liberty to vote for eighteen members of council, a treasurer, three vice-presidents, and a president; but should they, from doubt or want of information as to the suitability of the candidates, prefer to vote for a few names only, such limitation will not in any degree invalidate the votes for those actually selected.

Another point of not less importance occurs in relation to the retiring officers, who, in the voting papers, are only given as retiring officers, without any intimation that they are eligible for re-election; and from this fact, and the mode of printing their names, it does not seem with any certainty to appear that they are really issued as candidates for office. The very fact that some of them are definitely nominated for election, whilst others are not, gives further colour to this supposition. It should be borne in mind, however, that all the retiring officers are eligible for re-election to the offices they have individually held, without any personal nomination whatever, and all those printed as "retiring" are, in truth, printed so solely in order to place them as candidates for re-election.

Another form of complaint has reached us from several correspondents, but it is one upon which we can say but

little here. It is complained that members who have not paid their subscriptions for the coming year, before the annual meeting will be deprived of the privilege of voting; and it is complained that, without previous intimation, notices to that effect, in place of voting papers, have been sent to many members. As such a course appears to be in conformity with law, there is little to be said on the subject. One correspondent asks if it is ascertained that "every nominator has paid his subscription before he nominates, and if it will be ascertained that every officer has, in like manner, met his obligations before he is permitted to assume office." On these points the law says nothing. We can merely regret the questionable and offensive operation of a law which has been many years in existence, but which has not before, we believe, under similar circumstances, been applied, and, we may add, will probably not be applied again when once attention to its impolicy has been called. After the next annual meeting it is probable that the majority of the inconveniences and uncertainties caused by modification of law and usage will cease.

LICHTDRUCK PRINTING WITHOUT A PRESS.

CAPTAIN DELAUNOY has published in the *Bulletin Belge* a report upon Jacobsen's process of photo-mechanical printing without the aid of a press. In the first place a carbon print is obtained upon a provisional support of glass or metal. This support is coated with a thin varnish, which facilitates the transfer of the prints subsequently; that recommended is a three per cent. solution of gum-dammar in benzole. The developed picture is allowed to dry, and a margin of wax is applied all round. A solution made up according to the undermentioned formula is prepared:—

Gelatine	2 parts
Gum-arabic	1 part
Glycerine	1 "
Water	5 parts

The gum is dissolved first, and then the gelatine is added. When the latter has swollen sufficiently, the whole is warmed in a water bath, until completely dissolved. The solution is then filtered through damp muslin, and the glycerine added. This liquid is poured upon the carbon print in such thickness that the film, after it is set, is almost four to five millimetres thick. So that the gelatine may spread the better, and shall not cool too quickly, the plate is warmed during the application of the solution.

As soon as the film has become perfectly cool, it may be removed from the plate, but it is better to postpone the operation for four and twenty hours, for then it increases in solidity. The margin of wax is removed, and the film is carefully and gradually lifted off. The pigment picture remains in the gelatine film. If this print is now inked, an impression may be obtained by merely employing an india-rubber scraper.

Sometimes, on first applying the ink, the colouring matter remains adherent to the whole of the film. This does not matter much, however. It is only necessary to remove the colour with oil of turpentine, and to moisten the film with a damp sponge, when it will be found, after rolling a second time, that the ink only adheres to the shadows. In inking up, either the ordinary lithographic roller may be used, or a glass tube ground on the surface. The roller is coated with ink by passing it over a gelatine plate once or twice, produced in the same way as above indicated, and coated with a mixture of two parts of printer's ink with one part of lithographic varnish and a few drops of turpentine.

A few sheets of paper and an india-rubber scraper, such as is employed in carbon printing, is all the apparatus required for printing. You proceed as follows:—The gelatine film carrying the carbon print is placed upon an even surface. It is slightly moistened, and the excess of water

is removed with a wet sponge. Only the gelatine absorbs the moisture; the carbon print repels it, and takes up instead the fatty ink.

After the roller has been inked, it is passed over the picture until it has deposited sufficient ink. If the ink attaches itself over the whole surface of the film, it is a sign that too much varnish has been added to the ink. When the carbon picture has been well inked—a circumstance that is soon apparent after a little practice—a sheet of paper is put upon it, and rubbed two or three times over with the india-rubber scraper. The paper is then taken off the image, inked once more, and a second sheet of paper adjusted, when another print is secured. The printing goes on till the whole of the film becomes blackened, and then a moist sponge is passed over, and the work may begin again.

You must not press too firmly on the film, else the picture will sink in, and no more colour can be applied; in this case the film must be allowed to stand for a few hours, and then work may be proceeded with once more.

The process gives very good results in the case of black and white prints, but not if half tones have to be reproduced. At the same time prints of the latter nature have been produced in this way, which give hope of an improvement in the process in this direction.

A great drawback to the process, if but the only one, is the difficulty of getting the lines straight, for the warm gelatine poured upon the pigment picture dissolves away the edges of the line and distorts them. We are in the hope of proposing in a little while some means of overcoming this defect in the process.

AN ALBUMENIZER'S LAMENT.

BY W. T. BOVEY.

ALBUMENIZED paper! Thy name strikes not unpleasantly on the ear; thy smooth and polished surface assuredly deceives the eye if thou art aught but innocent. Yet manifold are the woes that, like foul fiends, lurk in thy spotless texture, and which, anon, will make men stamp with rage ere they consign thee to the flames as a worthless thing, a worker of hideousness and mystery. Nursed in all tenderness, handled with care, thou wert bathed in costly extracts, composed of the most precious metals. Well watched, thou hast basked in the sun, and on thy surface were printed, by an invisible agency, pictures of beauty, which, in their pristine purity, were viewed with feelings of hopefulness. Alas! to be exchanged for despair when, from the final water bath thou perchance may emerge stricken with leprosy, covered with spots, a useless and sudden deceiver, fitted only to perish by fire, or to be trampled under foot in a ditch! Say, then, ye initiated, "Why—wherefore—what can this mean?" Say: can it be that these evils have none other remedy besides fault-finding with the paper? Columns, counted in the aggregate, represent many volumes that have been written on the uses and abuses of albumenized paper. Perplexed photographers have in various ways received instruction, and have been recommended to try now this, now that—in all, no end of formulæ; whilst albumenizers have been lectured—often well scolded—and from them has been demanded that philosopher's stone, the secrets of salting, which presented, leave the consumers as wise as before. Most certainly the secret is theirs for the asking, but they can find no relief in their knowledge; and although this ado, this groaning and chaff, have grown stale by long usage, the fact needs no argument that we have entered upon another new year with indisputable evidence before us that the printing experience of the past has taught the majority of printers just nothing. The same kind of faults, repetitions of failure, blind reliance on formulæ, ignorance of principles, helplessness under trifling difficulties, the same eagerness to saddle with all sins of com-

mission and omission the much abused, but frequently innocent, paper.

Having had the good fortune—or, in some respects, misfortune—to have written on printing matters somewhat considerably, I feel that I at least must have failed as a teacher, otherwise my pupils are dullards and unteachable, and the space I from time to time occupy in the pages of the NEWS might have been more profitably employed in giving publicity to more valuable matters. Truly I often have noted in the teachings of others the same facts and phenomena which my pen pointed out and described years ago. I care not, however, to waste time in reclaiming discoveries, as I am one among those who believe that thoughts, like cart wheels, might accidentally move in one rut.

Manufacturers of albumenized papers, although a suspected race, are not quite so bad as they are sometimes painted; and who can measure the task they are sometimes called upon to perform? They have a host of fastidious patrons to please, and if their attempts to accomplish this feat ever turned out successful, the victor would be only one remove from the Pope, and his Holiness, you must know, is infallible! "Rap, rap." The postman has placed in my hands some half-a-dozen orders for paper. One asks for black tones, another purple and warm. The paper must be thick, must be thin, must in texture be fine, must be coarse, must give a vigorous print. Another must have sent him a paper capable of yielding a delicate image; "and pray do not forget to write out your very best formula." A writer in the Correspondence columns of the NEWS some time since protested against this anxious inquiry for instructions of the albumenizer. Blessings on so useful a friend. I fear, however, that his instructions, like my own, passed unnoticed; at all events, it is no unusual thing with me to receive applications for advice which would take at least two or three days to give all the details in writing. To present my case as I view it, in language candid and plain, I have no hesitation in asserting that whilst too much is demanded of the paper vendors, too little is known by printers of those principles on which depend that success which makes satisfactory the paper those vendors supply. Such being the plain truths attached to the case, I purpose, with a view of driving the fact closer home, and in as few words as possible, exposing, *pro bono publico*, the secrets of an albumenizer's trade.

First the raw material known as unprepared paper. Ah! in this matter our usually enterprising countrymen have permitted to slip through their fingers an opportunity of doing a well-paying trade. The German and French manufacturers have, however, the race to themselves, and of late the latter have been doing all the running. For several years the star of the house of Steinbach was in the ascendant; but since the decease of the senior member of the firm bearing that name, the quality of the paper produced at their mills, both in colour and texture, has gravely deteriorated, and the Rives papers have now the superior demand, so far as the English choice is concerned; nor can this alteration in their taste be well wondered at if we consider how admirably the French makers have succeeded in improving their paper; and the quality improves with the growing demand.

For some time past the prices of the raw material have been moving upwards, whilst competition has driven the quotations for albumenized paper seriously down. That in itself is no pleasant experience for the hard-pressed producer; but his troubles go further. The Germans having sent English photographers a favourite paper—favoured because of its extra bright glaze—the English albumenizers are thus placed between two stools: they must follow suite, or lose all their customers; hence, in lieu of the freshest of albumen, which once was their boast and their pride, they must perforce, ere they use it, allow their albumen to ferment, to emit a foul odour, or the

required glazed surface lies beyond their best skill. For know ye, O innocent photographers! that the brilliant surface on your paper, although set down in the advertisement as the product of albumen extracted from the freshest of eggs, is derived from an albumen whose original freshness has been exchanged ere it was used! Then it was stale. Fresh albumen, if rightly managed, is capable of giving a fair glaze, and can yield a good body; but the garish brilliancy now so often seen in photographic papers, and so generally admired, cannot be produced with unfermented albumen.

If the change of fashion just now alluded to entailed no further evil than is engendered by the mere use of stale albumen, practically no lessening of stability in the prints will probably ensue. There are, however, difficulties innumerable which accompany its employment, a few of which it might be profitable here to enumerate. "Tear-drops," unequal absorption in the process of sensitizing, followed by blotched prints; here all is right, there a lot of circular blurs, with none but the faintest traces of an image to be seen. Defects such as these arise from the use of a too concentrated silver solution, which "coagulates" the albumen too quickly, giving no time for the silver to combine with the chlorides within.

Next, I direct attention to the troubles of toning. Add more gold to the bath, and then come the "measles." This defect is occasioned by an absence of free nitrate, which must be present, or the prints cannot satisfactorily tone. And owing to the highly polished surface of a stale albumen print, the free nitrate is washed out in the first washing water. Less of preliminary washing. If that will not cure, no washing at all. One of these courses, if adopted, cannot fail of giving the conditions of toning success.

Next the blisters, concerning which so much has been written and said. To account for the cause of this evil I have only to add: stale albumen has an indifferent hold on the paper, whose surface has no interstices to act as safety-valves when the pressure exerted by the contact of fluids of different densities is brought into play. I have observed that in prints on paper subject to blisters, if fixed in a solution of moderate strength, and afterwards plunged into a large bulk of water, the blisters form thickly, but each so minute that when the paper is dried they disappear altogether. It might appear strange that I have laid stress on the use of a large bulk of water. I have, however, noticed that a considerable difference arises in the size of the blisters when the prints are immersed in a few pints of water. I can give no reason for this increase of dimensions. I therefore state the circumstance as I have found it.

In conclusion. My readers might safely accept this description as their rule: the higher the glaze, if not fictitious—or, in other words, the product of rolling—the greater will be the difficulties to be encountered in working. A paper to tone easily must be porous. A paper to print rapidly must not be low salted. A paper that "keeps" for days after sensitizing is in some way connected with acidity. A paper to give rich tones must have a rich image to begin with. A paper that gives brilliant tones can only do so when toned up with judgment. Even then the chief desideratum must be a suitable negative that can produce a vigorous image. In short, the papers prepared by most of our English albumenizers are capable of doing all that reason can require of them; that is to say, if the printer knows how to guide to success. The cuckoo cry, "O that abominable paper!" has really grown stale, and it is high time that this note of excuse should be changed. Given an evenly-albumenized paper, a clean surface, a honest "tale," and the albumenizer has done all that lies in his power to accomplish. Remember, his profit—once, I admit, great—is now driven down to the lowest possible mark. So I pray you, dear readers, cease to aggravate his as by your over-indulgence in groundless complaints.

ENLARGED NEGATIVES FROM SMALL ONES, WITHOUT A TRANSPARENCY, BY THE PLUMBAGO PROCESS.

BY GEORGE WILLIS.

SINCE I wrote my method of working the powder process which appeared in the *News*, November 20th, I have made further experiments with exactly the same sensitive solution as then stated, but in an entirely different direction. A plate of the size of 24 by 18 inches was coated with the sensitive solution, which I found could be as easily done as with collodion, by using a long glass rod to assist the solution to the edge of the plate. It was then drained, and placed on a sheet of blotting-paper in a large clean box, in the dark, for thirty minutes; then dried by the fire. A thin, good, detailed negative of the size of 4½ by 3½ was placed in the holder of the enlarging camera, which is a darkened room which has a plank of wood three inches thick planed smoothly, and with guiders at the side, and a clamping screw to fix the dark side in its place. This is placed in a slanting direction pointed to the sky. After the focus was got sharp on the ground glass, the plate was placed in the dark slide, and an exposure of thirty minutes was given. The plate was then placed face up on a sheet of white paper, and a large soft camel-hair brush was used to cover the plate with plumbago. It was found to be too soft and thin, which was the result of under-exposure. Another plate was prepared in the same way, and exposed for one hour, and the plumbago was rubbed on as before. After about fifteen minutes' labour with the brush a good negative was obtained.

Enlarged negatives from small ones, without any positive interference, as in this case, seem to me to be superior to all other methods of enlargement, so far as I can judge from the little experience I have had at present. There is one thing certain: that enlargements made in this way from a good, small, well-detailed negative (rather thin) are better modelled and more true in their proportions than ever can be hoped for from large direct heads taken from life, no matter how good the lens may be.

There is another thing: the enlarged negative may be in its true position or reversed, at will; the only thing to be done is to place the small negative which way you please in the camera, so that if a reversed negative is required it can be got without any transfer of the film, which is of great advantage for some of the mechanical processes. I have no doubt that in summer the exposure will be reduced to about fifteen minutes. I shall experiment further in this direction, as I have hopes that it will turn out to be the best process for enlargements; and I hope shortly to be able to lay before you both negatives and enlarged prints done by this process.

FICHTNER'S ASPHALTE PHOTO-ZINCOGRAPHIC PROCESS.*

THAT a thin film of asphalt when exposed to the action of the sun undergoes a change, and is afterwards less soluble in its previous solvent, is a well-known fact upon which many photographic processes are based. The sensitive varnish is prepared by dissolving five parts of Syrian asphalt in ninety parts of benzole, and adding ten parts of lavender or spike oil, and filtering the same. A great deal depends on the choice of the asphalt; those portions only should be chosen which do not melt in a temperature of 90° Reaumur, and which are difficult to dissolve in alcohol.

The benzole used must be separated by distillation from the more sensitive bodies it contains, and must be free from water. The other oil must be quite pure, and also free from water.

A perfectly clean and very smooth zinc plate is covered

* Correspondence.

with the sensitive varnish (in the same way precisely as a glass plate is coated with collodion), and the superfluous liquid allowed to drain off. The zinc plate is placed in a horizontal position in a dark room, so that the varnish may set in a layer of uniform thickness, and is allowed to dry thoroughly.

The negative to be printed is placed in an ordinary pressure-frame, and upon it is laid the zinc plate coated with the sensitive varnish; the two surfaces being pressed firmly together, and exposed in the sunlight for twenty-five to thirty minutes, or from three to four hours in diffused light. The duration of the printing depends, of course, very much upon the sensitive character of the varnish, and must be accurately determined by experiment.

The negative employed must have previously been reversed and secured upon a gelatine film, otherwise the print itself will be reversed. On taking the varnished surface out of the printing-frame, there should be no mark or impression upon it. The plate is poured over with petroleum to which one-fifth or one-sixth of its volume of benzole has been added, and the plate moved to and fro until the image is to be seen sharply defined, and there is a ground-work of clean metal. To stop the strong action of the developing liquid, the plate is put under a stream of water, and then allowed to dry in the light, so that the varnish hardens, and is more capable of resisting the action of the acid subsequently employed for etching.

The etching of the plate is done in the usual manner by means of very dilute nitric acid; the air-bubbles are dissipated as much as possible, and the plate is moved to and fro, which has the effect of accelerating the action of the acid. The etching is allowed to go as deep as necessary for its being printed in a printing-press. These plates may, if it is desired, be moulded in gutta-percha, and then reproduced by means of the electrotyping process.

Correspondence.

ELECTION OF OFFICERS OF THE PHOTOGRAPHIC SOCIETY.

SIR,—You have been good enough to tell us recently the precise *modus operandi* of the new laws for electing officers of the Photographic Society of Great Britain. But the voting paper I have just received seems to be at variance with your instructions. You informed us that an entirely new council would be required. The instructions on the voting paper make no mention of the number of officers, and, on referring to the law which is quoted, I find six members of council, one president, and one vice-president are annually to be elected. In the absence of official instructions, I presume that the printed law is the proper guide. Again, you informed us that the retiring officers would be eligible for re-election. But in the printed balloting paper I have received, whilst the names of the officers are, as a matter of course, printed at the head of an official document, there is no intimation that they are candidates for election, nor that all or any of them are eligible for re-election; they are simply described as the "retiring" officers, as in contradistinction to the candidates for re-election. Can you enlighten me as to the real state of the case?—

PERPLEXITY.

[All the retiring officers are eligible for re-election; and the election is for all officers. It is a pity that the balloting paper does leave the matter in some doubt.—ED.]

DEAR SIR,—I have just received an extraordinary circular from the Secretary of the Photographic Society, of which I am an old member. It informs me that in order to obtain the privilege of receiving a balloting paper, and the privilege of voting for officers for the coming year, I must first pay my subscription for that year. On reference to

the laws I find that "no member shall have the privilege of voting on any occasion unless he shall have paid his subscription for the current year." As I have been for many years a member of the society, I have generally paid my subscription at the close of the annual meeting, and have never before been told that I must pay my subscription previous to voting at that or any other meeting. I presume this must be one of the new rules about which we have heard so much during the past year, and I must be allowed to remark that it seems to me most offensive and impolitic.

In addition to the law being offensive and impolitic, I should venture to assert that its application on the present occasion is illegal. When I joined the Society the annual meeting was, as it is now, in February, and the subscriptions were due in February. I think I remember that during the last year or two the accounts have been made up to the end of December; but I cannot see that my liability for payment is altered by such a step. It seems probable that a large majority of the members will not have paid the subscription for the coming year before February, in which case they are practically disenfranchised; and the recent changes in law will limit instead of extending the voting powers of the members of the Society.—Yours very truly,

AN OLD MEMBER.

[There is a clause in the laws to the effect quoted by our correspondent, and it is really a part of the old rules. As the law making the financial year of the Society terminate at the end of December was, so far as we remember, duly passed, every member would become amenable to the modified law, and the subscription would be due in January. Considering, however, that many members would scarcely be likely to have paid their subscriptions before the annual meeting, we should certainly doubt the policy of putting in force a penal clause under such circumstances.—ED.]

REMUNERATION FOR NEW PROCESSES.

DEAR SIR,—I have little doubt that some of your clever contributors will be able to perfect a plan from the following idea. It is quite certain, in the present times of great competition, that no inventor of a new process can afford to give his time and experience for nothing, especially after the manner in which many kind gentlemen in the profession have been treated by Know-alls who knew all about it before, but were not generous enough to publish it if they did. We now miss the names of such masters in our art as Robinson, Col. Stuart Wortley, and many other practical men whom we provincials often had the chance of studying in print.

But now to the plan for investigating processes. Let two or three well-known men, from either the energetic South London or the Parent Society, form a committee of investigation. The inventor should enter his process on the books of the Society kept for the purpose, and at the time of entering should pay some fee. The process, if found perfect as stated by the inventor, should be granted a certificate stamped with the Society's seal. Then every purchaser of the process should pay a fee of five shillings for the seal of the Society, to be attached to every recipe issued, which would be a guarantee to the purchaser, and also form a fund for expense of investigation. This, I think, would be the means of keeping the vendors of old dishes re-cooked out of the market, and find many more purchasers for a really genuine article.—I remain, dear sir, yours very truly,

E. SHAYLER.

Redcar, January 27th.

COMMITTEES UPON SECRET PROCESSES.

SIR,—Will you permit me one or two words in reply to "W. E. B.," who seems strangely to misunderstand the aim of my former letter to which he refers. He says: "Photographers generally are willing to take and continue to receive freely. But what about the giving?" and so on.

He does not seem aware that he confounds two distinct things. When I quoted the passage, the meaning was surely clear to everyone, thus: freely ye have received *information*, freely give *information*. "W. E. B." seems to think it should be thus: freely ye have received *information*, freely give *money*! And because Archer, and Blair, and others freely gave the results of their study, process-mongers should, according to "W. E. B.," freely receive the money of the present generation of photographers! I will very readily admit that many photographers are not sufficiently grateful to the leading spirits who freely impart the results of their study for the good of the community; but the secret process-monger is too often one who has seized upon the results worked out and published by others, to sell for his own gain. Real novelties do not need to be sold as secrets in order to secure remuneration to their discoverers should remuneration be desired, as a real novelty can be patented, and, as a rule, when a process is sold as a secret, it is, if good not new, and if new unimportant. Nevertheless it may easily pay a busy man to buy such processes. The one point I have to urge is, that if committees are to be appointed they will do better service by reporting upon known but comparatively unpractised processes, than by reporting upon secret methods offered for sale. The remainder of "W. E. B.'s" illogical letter I may safely leave with the note you attached to it.—Yours very truly,

SENEX.

CAUTION.

SIR,—Will you allow me to caution photographers against a person calling round to obtain silver cuttings, chloride of silver, &c., and who has a habit of taking such things away, promising to remit the value, and then not doing so. Lenses, cameras, and spare apparatus generally he obtains in the same way with the same result. Even when he buys, and pays, the price given is far below the real value.—Respectfully,

SAMUEL FRY.

DIFFUSED LIGHT AS AN ACCELERATOR.—THE "FLAPPER."

SIR,—So many enquiries have been made per letter and post card, that parties must excuse my not answering sooner, having to go away from home a few days up to London. However, I have answered many, and I think, for the benefit of those who sent post-cards, you may publish that the flapper is a piece of white board painted in flattening, or even white cardboard, hinged to the camera-stand, and held up during exposure. This will reduce exposure.

Developer should be warmed, and try the following:—

Sulp. iron	1 ounce
Ammonia sulp. iron	1 "
Distilled or boiled water	30 ounces
Sulp. copper	1 drachm
Methylated spirits	3 ounces

Now add

Acetic acid	1 ounce
Acetic ether	40 drops

Should this be too active, add a little more acid.

Now try this, and let us know how you succeed.

AN OLD HAND.

[It will be seen that a board with white reflecting surface, hinged to the top of the camera-stand, so as to be held at right angles with the lens, will permit a certain quantity of reflected light to enter the camera and reach the sensitive plate, the precise amount under control being regulated by the position and extent of the reflecting surface.—Ed.]

LIFE-SIZE PORTRAITURE, OR ENLARGEMENTS VERSUS DIRECT PICTURES.

SIR,—Before entering upon the matter which the title of this letter indicates, I wish to devote a few words of acknowledgment to one of whom this country may justly be

proud, and to whom photographers owe a deal of gratitude. France has had her Duc de Luynes, Germany her Baron von Voightlander, and England prides herself in Robert Crawshaw as a noble emulator of these eminent men. It is not only on account of the valuable prizes offered and given by the distinguished amateur that he deserves our thanks, the least possible expression of which is a record in some permanent form, such as the articles in this volume offer to those of our profession who appreciate all good work done; but more particularly because Mr. Crawshaw revived and encouraged the production of life-sized photographs, which appeared to him to have been too much neglected. Moreover, these competitions afforded an excellent opportunity for testing the manipulative powers of photographers, the value of known combinations of chemicals, and the utmost capacities of existing lenses. It will thus be seen at a glance that work was given to the brains of all concerned: photographic chemists, opticians, and instrument-makers of every description were called upon to exert themselves, that a fresh effort might be made, another step taken in the right direction.

The object or true aim may have been, and to a certain extent was, misunderstood, and I make bold to affirm such a statement, because we cannot suppose that Mr. Crawshaw wished to arrive at any but a correct conclusion—the production of perfect life-size portraits. In the very words which announced the competitions we find the proof of this desire expressed clearly: "to encourage the production of life-size photographs of a more artistic character." However, in order not to lose sight of my immediate purpose, I beg in this place to offer my grateful acknowledgments of Mr. Robert Crawshaw's noble purpose, and to thank him the more sincerely, that while offering substantial prizes to be competed for, he pointed out the achievement to be constantly kept in mind—the production of artistic work.

Having performed a sort of duty which I felt it incumbent upon some one to discharge, I will now enter freely, though briefly, upon the consideration which I set myself as a task—enlargements *versus* direct pictures. The contests are now over, and let us hope that discontented minds and blighted hopes have been soothed. We have had two years of competitive efforts, and we have seen what could be done by all who make the attempt.

It must yet be fresh in the minds of most of us who felt an interest in the matter, what an outcry on the part of the press was raised by the first year's exhibition of life-sized photographs taken direct, and what an impression of dismay it created in the minds of all art-photographers who understand and have studied that branch of their profession, by first acquainting themselves with the optical laws which govern the working out of such problems. It was evident to all that no photographer of ability would ever attempt either to reproduce his sitters in that way, or presume to put before them results so obtained. To some, these statements may appear of a sweeping character, but I have good authority for going much further; after having entered my protest against the advisability or feasibility of taking life-sized photographs direct, I will show that even portraits obtained by enlargement cannot be without defects or distortions of every description, unless the small negative be so taken that the conditions of distance from the lens be fulfilled, and such lenses used as to warrant a perfect result.

A few extracts, which I will translate from a learned French book bearing on this subject, will suffice to illustrate my statements, and show to what great extent care must be used to remain within the prescribed limits:—

"We will state at once that most of the portraits now exhibited are altogether distorted. The cause is a very simple one, and the use of short focus lenses explains the matter perfectly. If I wished to describe the defects which arise from this mistake I might write a whole volume, but the fact can be easily ascertained. Artists are not to be deceived on this point, although the general public may be. A little consideration will suffice to make the thing evident; look at most portraits, examine the features, particularly notice the nose and chin—both are protruding and en-

larged to a surprising extent. Examine these large heads, and you will at once observe swollen faces in all of them. Some will say that this is an exaggerated description, but it is nothing more than absolute truth. The matter is easily explained, and to be traced solely to the use of imperfect or short focus lenses. By disregarding optical laws and the requirements of perspective, caricatures, instead of natural reproductions, are the results. Now what will be the consequence if you enlarge a negative which represents a portrait already defective in the smaller size? A drawing of an unpleasant incorrectness will naturally be the result, because all the defects will be proportionately magnified. While pointing out defects it is necessary to indicate the means of avoiding them; this is easily done—use medium or long focus lenses."

The limits of this letter do not allow of entering more fully into details, which, to most experienced photographers are well known, and could only be tedious; it will simply be necessary to refer those who wish to study the matter fully, to the work from which the foregoing observations have been extracted (*La Méthode des Portraits Grandeur Naturelle*, par M. Arthur Chevalier, Paris), the full perusal of which, or any other scientific work bearing upon the same subject, will satisfy the mind anxious for correct information that life-size portraits can only be obtained, *secundum artem*, by resorting to the operation termed enlargement, and that for such an operation it is also very necessary to secure a perfect negative as the first and indispensable requirement. Were it necessary to give further proof of the desirability of not allowing oneself to be persuaded to abandon the true principles long since laid down, we might find sufficient reason for it in the following words to be read in an article ("The Influence of Competition for Prizes") in the *PHOTOGRAPHIC NEWS*, November 27th, 1874, which show conclusively, with regard to taking life-size photographs direct, that the thing ought never to have been attempted, simply because photographers of ability have been engaged for over twenty years in the production of these pictures, and have never resorted to the direct process. The words referred to run thus:—"So far as we know, life-size heads, produced direct in the camera, had never been attempted, certainly never exhibited before."

Liverpool, November 30th, 1874.

C. FERRANTI.

Talk in the Studio.

SIMPLE COMBINATION PRINTING.—Mr. S. Fry informs us that, having tested Mr. Tilley's mode of combination printing with much success and satisfaction, he has acquired the interest in it with a view to bring it out and place it in the hands of photographers on satisfactory terms. He believes it will be regarded as a boon to the profession generally.

TRANSIT OF VENUS.—Some negatives and transparencies of the recent transit of Venus, taken by Mr. Bruton at Cape Town, will be exhibited, by means of the sciopicon, by Mr. Frederick York, at the Photographic Society's meeting on Tuesday evening next.

PHOTOGRAPHING THE NEXT ECLIPSE OF THE SUN.—Mr. A. Brothers, of Manchester, writes to the *Daily News* as follows:—"Everyone interested in the subject will be glad to see that Mr. Proctor has called attention to a mistake which it is probable will be made in the method proposed for making use of photography during the eclipse of the sun in April next. If the attempt is to be made to photograph the image of the corona as seen in the spectroscopic, no other result than failure may, I think, be looked for. The matter may be tested by any one having the proper apparatus, and the moon offers a favourable object. If an image of the full, or nearly full, moon can be obtained with a short exposure, then the brighter portions of the corona may give an image on the sensitive plate; but I anticipate that no trace of the less bright portions would be found in the picture. The spectroscopic yields to direct observation all the results of which it is capable. A photograph by its aid would decide nothing of interest, as we know already that the lines of the spectrum can be photographed. The photographs obtained during the eclipse of 1870 decided that the corona was an appendage of the sun. In 1871, with apparatus specially adapted, but similar to that used in 1870, the photographs confirmed the results of that year, and some extremely valuable pictures of the corona were obtained. The

interest in the subject was by no means exhausted at this point, and now an eclipse is close at hand when a most favourable opportunity will occur for repeating the photographic work, the chief interest in which will be the differences as compared with the pictures obtained in the years named above. With the apparatus used on former occasions only very small picture can be made. What is required now is a lens of such a size that it would give an image of the corona at least twice the size of any we have yet seen. Lenses of the kind here indicated ought to be prepared for use when required, and no eclipse of the sun for many years to come ought to be allowed to pass (as was the one last year) without some photographic record having been attempted. If the *Daguerreotype* process could be used in addition to the ordinary method, it would be very advantageous; and if the stations were supplied with duplicate apparatus, one for short exposures, taking (say) ten pictures, and the other for long exposures, to take four or five pictures, some interesting and valuable results might be anticipated."

REMOVING STAINS FROM CLOTHING.—Fresh ink and the soluble salts of iron—such as are used by photographers in their developing solutions, &c.—produce stains which, if allowed to dry, and especially if afterwards the material has been washed, are difficult to extract without injury to the ground. When fresh, such stains yield rapidly to a treatment with moistened cream of tartar, aided by a little friction, if the material or colour is delicate. If the ground be white, oxalic acid, employed in the form of a concentrated aqueous solution, will effectually remove fresh iron stains. Acids produce red stains, or blacks, blues, and violets, made from the vegetable colours (except indigo). If the acid has not been strong enough to destroy the material, and the stains are fresh, the colour may generally be restored by repeated soakings in dilute liquor ammonia, applied as locally as possible. Photographers frequently stain their clothes and cloths with nitrate of silver. The immediate and repeated application of a very weak solution of cyanide of potassium (accompanied by thorough rinsings in clean water) will generally remove these without injury to the colours.—*English Mechanic*.

ACTION OF MAGNETS ON SPECTRA.—Some recent experiments described by M. Choquet to the Academy of Sciences recall the early experiments of *Daguerreotypists*, in which attempts were made to augment sensitiveness to light by connecting the plate with a galvanic battery. M. Choquet states that the effect of magnetic influence on the spectra of the flames of sulphur and selenium is to cause them to pale, and finally to become quite extinguished. On the other hand, the same influence multiplies the rays and renders more brilliant the spectra of chlorine and bromine. The effect, says the investigator, is so rapid as to seem magical. The result of these discoveries is to render the deductions from the spectra of the heavenly bodies only to be accepted with great caution, as they virtually introduce a new element to be considered in drawing conclusions from the aspect of the same.

PHOTOGRAPHY AND ENGRAVING.—A curious paragraph appears in the *Paper and Printing Trades Journal*, in which a novel charge is inferentially made against photography. Referring to the possibility of producing printing blocks with white letters on a black ground as desirable for display, and the difficulties hitherto experienced in producing such blocks, it proceeds as follows in relation to a specimen block it prints:—"A cheap and effective method is required for producing casts from type with sunk letters and raised ground, so that the wording, no matter how small or complicated, will appear clear and sharp when worked. Many attempts have been made, and with varying success; but the results, so far as we know, have been expensive and uncertain. The block now shown was produced by the type being set, and pulled in a light blue ink; this impression was sent to a photographer, who made from it a glass negative, which gave white letters on a black ground. Messrs. Leitch then produced the block from an impression sent them. The result, as our readers will see, besides being expensive, is imperfect and unsatisfactory. The block is an exact facsimile of the negative, but the negative was blurred to commence with, and the photographer professes his inability to prepare a better." It cannot be doubted that the blurring referred to is not from any shortcoming of photography, but was at least a probable result of the production of the copy in blue printing ink on a dark ground. Such a method could scarcely do other than produce a somewhat blurred, uneven impression.

To Correspondents.

B. M. D.—One of the simplest and most efficient preventives of the paper discolouring when kept a long time in the printing-frame is the use of a piece of blotting-paper which has been soaked in a solution of carbonate of soda and dried. This should be placed at the back of the sensitive paper when placing it in the printing-frame. With very dense negatives it is very difficult to avoid discolouration in dull weather without some such aid.

JOHN STONE.—The uranium dry plates are still manufactured, the business having been transferred to Chambers and Co. You will find their announcement in the advertisement department of our last YEAR-BOOK.

W. B. G.—There is no work on the subject published; but you will find some very fully detailed practical articles in the News and in our YEAR-BOOKS. In that for 1870 you will find full and minute instructions.

SHALLOEWDIVCS.—You will find articles on producing transparencies for enlargement in several of our YEAR-BOOKS, especially in those for 1874 and 1875. You will also find very many such articles in the News, a reference to various indexes issued at the end of each year being the best aid in getting at them. In the volume for 1874, for instance, you will find articles on pages 32, 75, 395, and on several other pages. In the volume for 1873 you will find articles on pages 31, 76, 83, 300, 439, 527, &c.

A. STASCIBER.—The address is Mr. D. Rees, Photographic Artist, Clapham Road, London.

FILE.—Ordinary powder colours—such as were used for tinting Daguerreotypes and glass positives—may, with advantage, be used in slightly modifying negatives. We have frequently so used them many years ago. We found the most effective method of applying them—or, rather, of securing a surface to which they could easily be applied—consisted in applying a thin benzole varnish, or Newman's positive colouring varnish, to the negative, either before or after it had received its coating of hard aprit varnish. The powder colours may easily be made to adhere to the surface of the benzole varnish. Light and shadow may be effectively produced in a portrait background by applying a deep yellow in this way, using, of course, judgment and skill. The use of permanganate of potash for purifying water is easy and simple enough. Make a ten-grain solution of the permanganate, and add a drop or two to the water to be tested. If organic impurities be present, the pink tint which was first imparted to the water will gradually disappear, and the water will appear white and clear. Again add a few drops of the permanganate solution, repeating the process so long as the clearing process goes forward. The presence of a permanent trace of the pink tint is the evidence that all the organic matter present has been oxidized, and this tint may be removed by adding a little more of the water which has not been treated. Practically, the operations are gone through in treating a negative bath with solution.

M. D. F.—About one part of protosulphate of iron in three of water will make a saturated solution. If it be kept well stoppered or corked, so as to preserve it from the air, it will keep well enough. A slight trace of brown colouration will indicate that some peroxidation has taken place; but a trace of this is unimportant.

G.—So far as we know, the addition of a little glycerine to the collodion does not injure the bath; but it will, of course, be wise to make such addition cautiously, so as to avoid excess. It has been found very useful in modifying the effects of a horny, repellent collodion, and the contingent matt silver stains.

CYANIDE.—The action of cyanide of potassium as a poison is generally so rapid that remedies are of little avail. They should be applied immediately to be of any service at all. Ordinary iron developing solution might be given with advantage. If all the materials were at hand, the following is the best remedy:—Dissolve seventy minims of perchloride of iron and fifty grains of protosulphate of iron in an ounce of water. This would be a sufficient antidote to a drachm of cyanide, and if administered immediately might save life. The reaction between cyanide and the iron solution produces prussiate of potash, which is harmless.

BALLOTING PAPERS OF THE PHOTOGRAPHIC SOCIETY.—Several correspondents write asking various questions and making various comments, to which we need not reply in detail, as some remarks in a Leader will give the necessary information. AN AMATEUR will see that voting for six instead of eighteen members of council cannot invalidate a voting paper, inasmuch as no instructions as to the number to be elected are given on his voting paper. Y. must see that signing his name is not only unnecessary, but wrong, as that at once destroys the principle of the ballot, which is secrecy. The letters of A COUNTRYMAN, LEX, M. W., and others, would only reiterate what is stated in the letters we publish on another page.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR DECEMBER.

BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven,
36 feet above sea level.

Date.	THERMOMETER.			BAROMETER.			Direction of Wind at 9 a.m.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.	
1	36°	33°	29°	29.39	29.40	29.51	E.S.E. Fair, generally cloudy.
2	26	—	23	29.78	—	29.85	E. Fair and sunny.
3	38	43	36	29.85	29.82	29.90	N.N.W. Run a.m. and p.m.
4	43.7	46.5	45	29.80	29.69	29.48	S. Rain a.m. and p.m.
5	46	47	46	29.42	29.43	29.33	S.W. Rain this afternoon. Gloomy all day.
6	40	40	38	29.16	29.26	29.38	S.W. Run a.m. and p.m., with strong wind at night.
7	38	40	36	29.33	29.64	29.73	N. Heavy showers of sleet and hail, with strong wind a.m. & p.m.
8	38	40	44	29.45	28.81	28.54	S.S.E. Rain all day.
9	36	—	32	29.17	—	29.50	N.W. Fair, rather bright.
10	24	36	34	29.60	29.45	29.15	N. Fair and sunny.
11	34	38.4	36	29.54	29.46	28.51	N.E. Snow and rain a.m. Gloomy all day.
12	37	38	32	29.00	29.11	29.30	N. Fair, but gloomy.
13	35	37	32	29.48	29.50	29.76	N.E. Fair, but cloudy.
14	31	36	31	29.90	29.95	29.99	N. Fair and sunny.
15	27	34	31	29.90	29.75	29.35	N. Heavy snow-storm at night, with strong wind. Gloomy all day.
16	34	34	30	29.58	29.70	29.84	S.E. Fair, but gloomy.
17	28	—	25	29.99	30.07	30.15	N. Fair and bright.
18	30	42	42	30.00	29.90	29.71	S.E. Drizzling rain all this afternoon.
19	38	38	34	29.75	29.70	29.19	N. Fair and sunny.
20	34	38	34	29.48	29.40	29.34	N. Fair, but gloomy.
21	31	38	32	29.40	29.38	29.46	N. Fair and sunny.
22	28	34	25	29.61	29.63	29.76	N. Fair and sunny.
23	28	28	30.3	29.79	29.74	29.50	N. Fair. Gloomy. Foggy a.m. wind p.m.
24	31	31	32	29.33	29.40	29.48	S.S.E. Rain this morning. Foggy all day.
25	32	34	31.7	29.56	29.68	29.69	N. Fair, generally gloomy. Foggy.
26	34	37	33	29.76	29.83	29.89	N. Fair, generally sunny.
27	—	—	34	31.00	—	30.01	N. Snow this afternoon.
28	22.5	32	23	29.03	30.06	29.02	N.E. Dense fog this afternoon. Gloomy all day.
29	30	32	23	29.99	30.01	30.05	S.E. Fair, but gloomy.
30	22	32	28	29.12	30.10	30.08	N. Fair and sunny.
31	18	30	23	30.02	29.93	29.94	N.E. Fair and sunny.

From the above observations I arrive at the following:—

		Mornings.	Noons.	Nights.
Maximum temperature observed	...	46°	47°	45°
Minimum ditto	...	18	25	23
Mean ditto	...	32.1	36.9	32.6

Mean of whole	...	...	...	33.8	...
Fair days during the month	...	...	...	...	20
Days on which rain fell	...	...	...	...	11
Fair days on which it was sunny	...	...	...	...	11
Fair days on which it was gloomy	...	...	...	...	9

Braystones, January 2nd.

PHOTOGRAPHS REGISTERED.

- Mr. J. W. CLARK, Bury-St.-Edmunds.**
Photograph of the Duke of Cambridge.
Photograph of Miss Trendall.
Photograph of B. B. H. Rolwell, Esq.
- Mr. W. H. MOORE, Bristol.**
Photograph of Bristol Royal Infirmary.
Photograph of Model of Bristol Grammar School.
- Mr. J. HUDSON, Killarney.**
Two Photographs of the Remains of Arch-leacon O'Sullivan.
- Mr. CATFORD, Ilfracombe.**
Three Photographs of a Scroll Border for an Almanac.
- Mr. WYATT, Farnham.**
Two Photographs of Sket hes made by the Clumant during the Summing-up.
- Mr. E. REEVE, Lewes.**
Photograph from Drawing of the Celebration of Anniversary of the Gunpowder Plot at Lewes, November 5, 1871.
- Mr. W. G. SNOW, Llanelli.**
Photograph of Mrs. James Buckley and Child.
- Mr. W. G. LEWIS, Bath.**
Photograph of Rev. C. Kemble.
- Messrs. J. and T. TAYLOR, Bristol.**
Six Photographs of Westonbirt House.
- Mr. W. C. LANKESTER, Poole, Dorset.**
Photograph of Cefe Castle.
- Mr. A. GOODCHILD, Rother.**
Photograph of Coatham Pier.
- Mr. E. L. GRAHAM, Leamington.**
Photograph of Countess of Warwick.
Photograph of Earl of Warwick.
Photograph of Earl and Countess of Warwick and Family.
- Mr. J. CLAYTON, Nottingham.**
Photograph of Rev. R. W. Sibthorpe.

The Photographic News, February 12, 1875.**PHOTOGRAPHY IN AND OUT OF THE STUDIO.****HOW TO BLEACH SHELLAC—THE PHOTOGRAPHS OF THE SUN AND VENUS—CHLORIDE OF ZINC AND GELATINE—A TAX ON PHOTOGRAPHS.**

How to Bleach Shellac.—Those who employ bleached shellac in the preparation of their varnish often complain of its inferiority, for when in the form of a film upon the silver image it turns out brittle and very liable to crack. For this reason photographers generally content themselves with employing a light sample of shellac, which has, however, not been bleached, preferring to put up with the inconvenience of the colour rather than run the risk of having a covering to their negatives which is not trustworthy. A plan for producing bleached shellac without in any way injuring its other properties has recently been given in the *Hessian Industrial Journal*, and as the subject is one that interests all photographers, we think the information may be useful to our readers. Ordinary shellac of good quality is dissolved in strong spirits of wine, and to the solution is added sufficient bone charcoal, in a finely powdered condition, to make a thin paste. This is put into a bottle of transparent glass, and placed in bright sunlight for a few days, care being taken to shake up the mixture occasionally. Finally, the liquid is filtered, and the result is a solution of shellac which is of a very pale nature. We have no doubt that such a solution would be far better adapted to photographic purposes than one made from the bleached lac usually obtained in commerce.

The Photographs of the Sun and Venus.—We have seen some copies of the photographs taken on the occasion of the transit of Venus, and it is surprising how clearly the phenomenon appears on the plates. The pictures show a luminous disc of the sun about the size of an apple, the limb of the sun being, in some of the pictures, far from sharp. Venus is seen like a tiny black corn in the middle of the white ground formed by the sun, now entering the sun's limb, now progressing through the disc. The path can be accurately followed in examining a series of the photographs, and there should be little difficulty felt in making accurate measurements from the photographic results obtained. Some time must necessarily elapse before we receive the fruits of the investigations, for the calculations cannot be definitely concluded until the results from stations in different parts of the world have been received and inspected. It is said that the abstruse calculations will require days to undertake, and, as we have already stated, the Russians are looked forward to as being those from whom we may look first for an opinion. In the meantime it is matter for congratulation that our observers have been generally so successful in their efforts, and that the expenditure of so much labour and money has not been without a fair return.

Chloride of Zinc and Gelatine.—The use of chloride of zinc is being advocated in France just now for employment in colloid printing. It has been found that this substance is peculiarly fitted for admixture with size or glue, in order to prevent its decomposition. Paper sized with gelatine to which a little chloride of zinc solution—say of six per cent. strength—has been added, possesses, moreover, the faculty of repelling moisture. The use of chloride of zinc with gelatine, employed as a colloid film, is also important, for if a printing block is immersed for a short time in the zinc liquid, the consistence of the gelatine is increased, and it becomes more solid, so that a larger number of prints may be pulled from its surface. The zinc, moreover, it is said, makes the gelatine surface more repellent of the ink, and the clogging of the plate with the black pigment is not so frequent as when gelatine alone is employed. If this is really the case, chloride of zinc will be an important assistance indeed to the photo-

mechanical printer, for the giving way of the printing block, and the adherence of ink over its surface, after the work has proceeded for some time, are two of the gravest difficulties to be contended with. Chloride of zinc thus employed would no doubt be a more innocuous clearing agent than acid, for the latter always acts injuriously on fine lines, unless very great care is exercised in the matter.

A Tax on Photographs.—The question of a tax on photographs has again been referred to, but we think there is little chance of such a measure being taken. A step of this kind would be as difficult to carry out as the tax upon matches, and would probably be quite as unpopular. Only professional photographers could be taxed, for it would be impossible to charge for every print produced by an amateur. This alone would lead to endless difficulties, for the question would be continually arising as to whether a picture was an amateur or professional production. Again, an amateur negative might be printed by a professional photographer, or *vice versa*, giving rise to endless difficulties. Another question would be as to the nature of the stamp, whether the same would be necessary upon a small as upon a large picture, upon a portrait as upon a landscape; and again a definition would have to be given as to what constitutes a portrait and a landscape. We see the horizon so beset with cloud and fog, that any Chancellor of the Exchequer would need be a bold man who resolved to tax photographs. The utmost he could do, we should think, would be to issue licences to professional photographers; but even such a measure as this would be most unsatisfactory and difficult to carry out.

FRENCH CORRESPONDENCE.**PERMANENT PHOTOGRAPHIC PRINTS—PROGRESS IN PHOTOCHROMY—REMOVAL OF THE PHOTOGRAPHIC FILM FROM GLASS—A SIMPLE ARTIFICIAL LIGHT—COMPARATIVE EXPERIMENTS WITH DIFFERENT SOURCES OF ILLUMINATION.**

At the last meeting of the French Photographic Society, held on the 5th inst., a good deal transpired to bear out what I have already stated in previous letters about the progress recently made in the new methods of printing, whether in carbon or greasy ink. M. Franck de Villecholle laid before the Society a numerous series of prints of various kinds, both upon paper and upon glass, by Mr. Johnson's method; and Professor Stebbing presented a collection of stereoscopic pictures, and others, printed by M. Finlow, of Warwick. The latter productions proved that it was possible to print from four to five hundred impressions a day from the same gelatine block. All the specimens were of a most perfect description, and could compare very well with the best productions obtained by means of silver salts.

M. Leon Vidal, who follows up his work with as much success as energy, sent me four impressions obtained by his new heliochromic process, for presentation to the Society. There was, first of all, a reproduction of a steam engine showing different metals; a mantelpiece in bronze, gilt, and enamel; and two bust portraits, carte size. The clichés from which the impressions were taken were by M. Walery, of Marseilles.

The mantelpiece was the most remarkable of all, for the gilt was matt in certain places, and burnished in others; this appearance has been most accurately reproduced in the photochromic print. As the author remarks in his note, a mere examination of this specimen suffices to show the wide application that may be made of the process in the depiction of artistic objects alone. To any one who has but the slightest idea of painting or chromo-lithography, it is evident that it would be impossible to obtain a reproduction of the same kind, either by means of the brush or by lithography, without giving up much time to the matter; and at all events, it would be a most costly and laborious affair without the aid of the camera.

Thanks to the photochromic process, it is possible, without being even painter or draughtsman, to obtain automatically veritable paintings exactly representing the model, and to pull them off in considerable numbers, the impressions being of an inexpensive character, cartes-de-visite, for instance, costing but fifty centimes each. "At the present moment," says M. Vidal in his note, "the practical process has been brought to a point of perfection sufficiently advanced to allow photography to include it as one of its branches, and to permit of the widest and most unexpected applications.

A member of the Society made known at the meeting a very simple means of removing from the surface of glass the film of any cliché that may have been secured upon that basis. The method consists in rubbing the glass, before collodionizing it, by means of a tuft of cotton wool and some talc powder. The plate is then coated with collodion in the ordinary manner, and when the cliché has been taken, it may be gummed over, and yet removed with the greatest facility.

Another member remarked that the same method made use of before the preparation of plates by the Taupenot method (collodio-albumen process) preserves them effectually from any lifting of the film, which is sometimes experienced to the annoyance of the operator.

At the end of the meeting, MM. Riche et Bardy produced and exhibited to the members present a new light, of the most photogenic character, which seems likely to afford the most important services to the photographer. It was produced simply by directing a jet of oxygen upon a bit of burning sulphur.

I spoke recently of the binoxide of nitrogen and bisulphide of carbon lamp of MM. Delachenal et Mermet. I said that it gave a very photogenic light, exceedingly regular in its character. Unfortunately, this lamp is founded on the employment of two gases whose combination gives rise to explosions, and, consequently, is looked upon with suspicion in photographic studios, especially as the gases eliminated are, moreover, of a most dangerous character. The illness, just now, of my friend Professor Stebbing, who has taken rather an active part in the experiments recently made on the subject, is a sad and striking illustration of this.

MM. Riche et Bardy have made an investigation of the matter, to discover whether it is the carbon or the sulphur from the bisulphide of carbon which furnishes the photogenic rays. To solve the question, they compared, first of all, in a series of experiments, such lights as are rich in sulphur, and in order to render account of their action upon photographic preparations, they proceeded in the manner following. They procured a glass plate prepared with pure bromide of silver by M. Stebbing, and cut it into strips two centimetres broad by ten long, and these strips they exposed one after the other under identical conditions to the influence of the various kinds of light they desired to examine. The experiments were all made the same evening; the sensitive plates were placed at a distance of fifty centimetres from the source of light, and the exposure lasted sixty seconds, an interval registered by means of a chronometer.

The sensitive plates were enclosed in a slide under a screen furnished by ten sheets of waxed paper, superposed, two centimetres broad and of variable length. One measured ten centimetres, and, consequently, covered the entire length of the sensitive plate; the second measured nine centimetres, the third eight, and so on, until the tenth piece, which was but one centimetre long. These latter were pressed between a sheet of glass on one side, and a slice of horn on the other. The latter had marked upon it figures from one to ten, at equal distances, in such a way that the figure No. 1 was under the part corresponding to a single sheet, while the figure No. 10 was under

that portion where the ten sheets of paper were superposed.

In this manner a screen was secured, the opacity of which was in proportion to the number of sheets superposed, which were indicated by numbers. For instance, if, after an experiment, it was found that the figures 1 and 2 were visible, and that, in another, the figures 1, 2, 3, 4, and 5 were seen, then it might be concluded that the photogenic power in the second instance was stronger than in the first experiment, in the proportion of 5 and 2.

All the plates—prepared as dry plates, of course—were developed at one and the same time, and the table below shows the principal results obtained:—

The oxyhydrogen light	showed as far as	No. 1
The Drummond light	do	" 3
Zinc burning in oxygen	do	" 4
Magnesium lamp	do	" 5
A current of binoxide of nitrogen in a flask containing bisulphide of carbon, as far as		" 6
A jet of binoxide of nitrogen upon a stream of bisulphide of carbon showed as far as		" 7
A jet of oxygen upon a stream of bisulphide of carbon showed as far as...		" 7
A jet of oxygen upon burning sulphur		" 8

Consequently, it is the light produced by the action of oxygen upon sulphur which, according to MM. Riche et Bardy, gives the greatest impression upon bromide of silver, and for this reason they do not hesitate to recommend its employment practically. It has, besides, other weighty advantages. It is not liable to explosion, and it is by no means costly, for there is but little apparatus necessary. An earthen vessel in which the sulphur is lighted, and a bag full of oxygen gas (which anybody may make for himself, or may purchase in commerce), are all that is necessary.

The surface of combustion may be augmented at will by employing for burning the sulphur a long vessel, so that several jets of gas may be directed from the bag upon the burning sulphur.

This artificial light, it must be admitted, possesses one drawback, like all others which deal with sulphide of carbon: a suffocating odour of sulphurous acid results from the light; but it is easy to get over this difficulty in a laboratory by placing the light under a chimney. The fumes are not very great in a spacious room; but in a small apartment they are very unpleasant, and should be avoided. The most simple remedy consists in placing the vessel containing the sulphur under a large tube communicating with the chimney, in which a current of air is set up; or, better still, burning the sulphur in a glazed cupboard which is ventilated by a chimney shaft.

The experiments made by MM. Riche et Bardy before the French Photographic Society, with the assistance of Professor Stebbing, proved of the greatest interest to the members assembled.

ERNEST LACAN.

ON THE VARIOUS STYLES IN PORTRAITURE.

BY J. M. TURNBULL.*

In the present short paper on the above subject, I will first set out by noting the various processes and phases photography has passed through. I do not, however, intend to dwell on them. Photography, for so young an art, has had many and various transitions, from the metal in the Daguerreotype to glass in the positive, and from that to paper in the negative process, to carbon tissue in the autotype, to greasy ink in the photo-lithographic and heliotype, till it will be difficult to tell where its various and final ramifications will end. Like other arts, it has

* Read before the Edinburgh Photographic Society.

also had its fashions and its follies. At one time the rage would be stereoscopic; at another microscopic; at another time enlargements would be the cry, at another some new dry process would absorb attention; while at another time photography would be chasing after some new and patented process which was to create a revolution in photography, but which would in the course of a few months be quietly put to bed, never to lift its head again.

Photography may be divided into four parts: chemical, artistic, optical, and mechanical. It is natural, in an art like photography, that that part of it which first had birth (namely, the chemical) should first engage the attention of those professing it, and that until the conditions required of it in that direction were understood, little progress could be made with the others. I need not here speak of the optical and mechanical, as they have kept pace with the chemical: when the chemical conditions called for mechanical arrangements, they were not found wanting. I do not overstep the mark when I say that the chemical and mechanical conditions required in photography are now so thoroughly understood that they may be considered as perfect. When I say this, I am very far from thinking we are at the limit of our chemical knowledge as regards photography—indeed, I hope not—but what I mean to convey is, that the wet process, by which photography is ordinarily practised, is now so well understood, that I should not regard any man who is a professional photographer as worthy of the name who would make the condition of his chemicals an excuse for bad work. It is different, however, with the artistic division of the art, which has only of late years begun to attract the attention it deserves. It could not be expected of the early practitioners of the art that they could devote much of their attention to artistic matters, when they were groping their way with chemical difficulties and bad materials, sometimes brightened up by the appearance of one good picture out of a dozen bad ones, at other times in the depth of despair, from some cause or other which was then beyond their knowledge.

In the Paris Exhibition of 1867 were exhibited some remarkable photographs; they were by a gentleman whose name has since become widely known: I refer to Adam-Salomon. The opinions regarding those pictures were very different. The opinion of some was to the effect that they were photographs untouched, while others maintained that a great deal of their effect was attained from retouching; while others went the length of saying that they were not photographs, and that their whole effect was due to working-up. But all agreed as to their beauty, and that whatever their success was due to, they were pictures such as had never been before produced by photography. The practical effect of the exhibition of these pictures was to open the eyes of those interested in photography, more widely than ever they had been before, as to its capabilities, both artistic and manipulative. Their effect was to raise up many imitators of their style, and also to draw attention to the retouching of both the negative and print, to both of which the success of these pictures was no doubt partly due.

This retouching the negative has with some photographers assumed the form of a mania, so much so that every picture done by them, whether good or bad, had to be retouched, and this to such an extent that the photographic deficiencies were not only touched out, but others, due entirely to the touching, were put in, till the final result was a silly waxified looking picture, the effect of which could not be considered due to photography. I do not deny that the result of retouching was sometimes what might be called pretty to look at, but when looking at any of these excessively retouched prints, it always puts me in mind of the following incident. When I was about nine or ten years of age (now a good many years since) I was taken to see a large travelling waxwork, by a near relative of my own.

After having seen the whole collection, from Daniel in the lion's den, and King Solomon in all his glory, to the last celebrated murderer—after having seen them to my heart's content—the question was put to me, "But do you not see that they want something?" After having in vain guessed what it might be, seeing that the figures were not only properly but gorgeously dressed, that there was real hair on their heads, and colour in their cheeks, and that some of them were actually moving, I at length asked what it might be they wanted, and got for an answer, "They wanted life." Now I never look at any excessively retouched (and may be beautiful) pictures, but the vision of the waxwork crops up, while the thought comes in my mind, "they want life." Certainly, if photography is capable of rendering a face with any degree of character or life in it, retouching, such as has been practised for years back, is just as capable of polishing it out again. It must not be thought, from what I have said, that I entirely condemn retouching. Photography has its defects as to colour, and it imperfectly renders some faces, as we all know; these defects I consider it quite legitimate to remove what I condemn is, the abuse or indiscriminate use of it, and the almost entire obliteration of all the delicate photographic detail. It is the practice of some photographers to sit for hours touching a single head, while all the touching that I would consider necessary would be to strengthen a little some of the lights, or make up any deficiency in the shadows, or entirely touch-out any small defects, all of which could be done in a few minutes. I am glad to see that a more healthy opinion regarding touching is beginning to spread among those who practise it most, and that those who formerly would not use it at all are now putting it to its legitimate use. I will wind up what I have to say on this point by a quotation from Sir Joshua Reynolds:—"The highest finishing is labour in vain, unless at the same time there is preserved a breadth of light and shadow." Now retouching cannot put shadows in, though it takes them out; the most it can do in this direction being to bring up the lights, which is a very different thing from putting in shadows; in fact, its whole tendency is unnaturally to flatten. My opinion of retouching, therefore, is, the less of it the better.

One of the latest styles of portraiture I will now say a few words about. Though it is somewhat of a misnomer to call these pictures "Rembrandts" (at least, in so far as they bear any resemblance to portraits by Rembrandt), I do not object to the name, as they certainly bear a closer likeness to the style of Rembrandt than that of any other painter. But the pictures which pass current as Rembrandt in photography have certainly little in common with pictures by that master. They want that beautiful luminous softness which is most apparent in Rembrandt's works, and I have never as yet seen any attempt in photographic Rembrandts to break up the black even background on which they are usually done. This is very different from the backgrounds in Rembrandt's pictures, which, though generally painted in a very low tone, are always full of gradation, softness, and contrast, which give value and roundness to the figure. Listen while I give an extract from Fuseli:—"None ever like Rembrandt knew how to improve an accident into a beauty, or give importance to a trifle; if ever he had a master, he had no followers. Holland was not made to comprehend his power; the succeeding school of colourists were content to tip the cottage, the hamlet, the boor, the ale-pot, the shambles, and the haze of winter, with orient hues, or the glow of setting summer suns. No one combined with so much transcendent excellence so many in all other men unpardonable faults, and reconciled us to them. He possessed the full empire of light and shade, and all the tints that float between them; he tinged his pencil with equal success in the cool of dawn, in the noonday ray, in the livid flash, in evanescent twilight, and rendered darkness visible."

Photographic portraiture in the so-called Rembrandt style has, however, been a valuable lesson to photographers; it has led them to study more than ever they had previously done the various styles and effects in lighting, and the different ways and conditions under which a pleasing and satisfactory result could be arrived at. If Rembrandt photography had done nothing more than this, I hold that it will have done a great deal to advance photography. It is only by the careful study of lighting and posing the figure that photography can have any claims on, or make any real advance into, the domain of art. I do not, however, think that the Rembrandt style of lighting is the ultimate object which it should be the photographer's highest ambition to achieve or master. I think it should only be a stepping-stone to lead us on in the study of lighting.

Of what I regard as the highest style in portraiture, examples are to be found in the works of Reynolds, Laurence, Gainsborough, Sir Henry Raeburn, Jackson, Northcole, and others. There is now on view at our Industrial Museum a collection of engravings from the South Kensington Museum, which is the finest collection of engraved portraits I have ever seen. They are nearly all of them splendid specimens of portraiture, but there are some of them that I can only characterize by calling them gems. Amongst these are a portrait of Sir G. Beaumont, by Hopner; the Earl of Egremont, by Philips; Davies Gilbert, by Howard (this picture, I sec, has been presented to the Museum by Dr. Diamond). There are two beauties in the same frame, namely, the portrait of Flaxman, painted by Jackson, and that of Chantry, by Raeburn. There are also many other splendid examples of what I regard as the highest style of portraiture, examination and careful study of which will well repay those interested in the artistic advancement of photography.

A BATCH OF RECIPES.

We cull from the pages of our excellent contemporary, the *Scientific American*, a batch of small recipes, all of which will probably be found of service at some time or other by photographers:—

"Protosulphate of iron in powder, rubbed up with raw linseed oil, is an antidote for external poisoning by cyanide of potassium.

"Rubber rings, slipped over bottles in packing, ensure safety against breakage.

"Leather can be made hard by saturation in a solution of shellac in alcohol.

"Paraffine is the best material for protecting polished steel or iron from rust.

"Photographers who use large quantities of nitrate of silver should allow all the excess of silver, acetic acid, and other matters from the plates undergoing development to run into stone jars containing fragments of zinc. By that means the metallic silver may be collected. It should then be digested with dilute sulphuric acid, washed, and dried in an oven, so that quite a large saving may result.

"Lead nine parts, antimony two parts, and bismuth one part, is an alloy which expands on cooling, and which will be found useful in filling small defects in iron castings, &c.

"Glycerine is an excellent coating for the interior of plaster moulds.

"A strong solution of sulphate of magnesia gives a beautiful quality to whitewash.

"Glass can be drilled with a tool moistened with dilute sulphuric acid. This last is better than turpentine.

"White lead rubbed up with linseed oil to the consistency of paste is an excellent application for burns.

"Gelatine mixed with glycerine is liquid while hot, but

an elastic solid when cold. Useful for hermetically sealing bottles.

"Black cement for bottle corks consists of pitch hardened by the addition of resin and brickdust.

"Soap and water is the best material for cleaning jewellery.

"Awnings may be made waterproof by plunging first in a solution containing twenty per cent. soap, and afterwards in another solution containing the same percentage of copper. Wash afterwards.

"A handful of quicklime, mixed in four ounces of linseed oil, and boiled to a good thickness, makes, when spread on plates and hardened, a glue which can be used in the ordinary way, but which will resist fire.

"A good walnut stain for wood is composed of water one quart, washing soda one and a-half ounces, Vandyke brown two and a-half ounces, bichromate of potash quarter of an ounce. Boil for ten minutes, and apply with a brush, either hot or cold.

"A piece of alum as big as a nut will render clear a pail of muddy water. Dissolve the alum, stir, and allow the impurities to settle."

FURTHER OBSERVATIONS UPON SENSITIZERS.

BY PROFESSOR H. VOGEL.*

It has been settled beyond dispute that there are certain bodies which augment very considerably the sensitiveness to light of photographic bromo-iodide of silver plates, such, for instance, as nitrate of silver, nitrate of mercury, morphine, pyrogallie acid, tannin, &c. Some time ago I proved that the property of these bodies rests partially on the tendency to combine with iodine, but is also dependent upon their absorption power of light rays. Among other things, I showed that pyrogallie acid may act sometimes as an accelerator of, and sometimes as retarding, the decomposition of light, according as it is employed one way or another, allowing the light to pass through, or become absorbed. Thus a solution of pyrogallie acid upon iodide of silver plates lessens the sensitiveness of the same, because it renders them more transparent; whereas if the covering of pyrogallie acid is allowed to dry, the sensitiveness of the plates is materially enhanced, because the transparency then disappears.

Now it is very remarkable that certain sensitizers upon bromide of silver act differently upon iodide and bromo-iodide of silver. I first remarked this fact with morphine. A solution of this material made up by dissolving one gramme of pure morphine in 1,400 grammes of water acts as a vigorous sensitizer upon bromo-iodide of silver; it enhances very materially even the same for green and yellow rays, as I have found in my spectrum experiments. Upon bromide of silver there is nothing of such a sensitizing action to be observed. Neither in taking ordinary objects in the camera, nor in working with the spectrum, is an exalted sensitiveness of bromide of silver to be found in the presence of morphine, even in a dry state, but rather a decrease of the same, if anything. A similar negative result is given by pyrogallie acid upon bromide of silver.

This fact is not a solitary one. The same thing may be remarked with coloured sensitizers, such as fuchsine, for instance. This renders bromide of silver very sensitive to the action of yellow rays, so that with a long exposure the working of the yellow light exceeds that of the blue. Quite different is the action upon chloride of silver; in this case, in a short exposure, there is nothing to be observed of an increase of sensitiveness for the yellow rays; it is only after some time that the action becomes

apparent, and then in a less degree than in the bromide of silver.

It will be seen, therefore, that one cannot deduce from the action of an accelerative upon one silver salt the results of its action upon another.

An explanation of this abnormal behaviour should be sought for more in physical than in chemical influences. The plates are only affected radically by such rays as they absorb. The absorption depends, however, not alone upon the action of the colouring matter or sensitizer added, but upon their action in common with the chloride of silver or bromide of silver and the collodion. Perfectly neutral bodies may have an influence in the matter. Fuchsin dissolved in alcohol absorb, for instance, only yellow and greenish-yellow, but dissolved in ether, or collodion, it absorbs the orange rays. For this reason it is that bromide of silver coloured with fuchsin is sensitive, not only to greenish-yellow rays, but also to orange. If chloride of silver shows this action in a lesser degree, it may be because that salt modifies the absorption properties of fuchsin. Further experiments in the matter are being undertaken.

So much, however, may be remarked in regard to the preparation of dry plates, viz., that it is an error to suppose that a preservative which works favourably for iodide of silver plates has the same action upon dry plates prepared with bromide of silver.

Recent Patents.

A REVOLVING CAMERA.

BY EDWARD HODGSON.

THE following specification describes a camera with revolving drum carrying a series of plates, in place of the ordinary dark slide. The patent was not completed.

"This invention relates to cameras for taking photographs in the studio or in the open country, and has for its objects to supersede the present form of cameras, with their cumbersome dark slides and focussing screens, which are continually getting out of order, and the intricate or complex arrangements of ordinary dry plate cameras; for getting the prepared plates into position without damaging the film thereon, or breaking the glass plate intended to receive or carry the negative picture; and to take or produce a number of pictures more rapidly and at less cost than by any other photographic apparatus hitherto used for the purpose.

"The means by which I propose to carry out the said objects of my present invention are as follows:—I construct a hollow drum, or the skeleton frame of a drum, or of a many-sided figure hereinafter called the 'drum,' of suitable materials and dimensions, in the top and bottom discs of which drum grooves are cut or formed thereon for the insertion therein of any convenient number of prepared glass plates, either wet or dry, on which portraits or other pictures are to be photographed. The skeleton frame may also be formed with any number of sides, according to the size and number of the plates desired to be placed therein, leaving a narrow slit or opening behind or opposite to a fixed plate of ground glass, called the 'focussing glass,' to focus through. The angle pieces of the said skeleton frame are properly grooved to receive and hold the prepared glass plates. These arrangements being made, so as to form a figure with regular and equal sides, or nearly so, in order that each prepared glass plate may, in succession, be brought, by the motion or turning of the drum, into the exact position previously occupied by the focussing glass, this drum is then inserted in a box or case, and is so pivotted therein that it can be freely revolved or turned by a handle or finger fixed on the upper pivot outside the said box. This box is provided in front with a sliding lens, and behind, or directly opposite the said lens, with a small strip or plate of yellow or other suitably coloured glass to focus through, and to protect the prepared plates from the effects of the light thereon when revolving the drum.

"Securely fixed on the top or lid of the box, and centred on the said upper pivot of the drum, is a circular dial plate, on and near to the circumference of which, at the proper distances, numbers or figures are placed corresponding with the number of plates or sides of the drum. The ground or focussing glass plate being fixed in, and forming one side of, the drum, is always in its place, and cannot be easily damaged or destroyed; this focussing glass I denominate Number 1, and the prepared glass plate next thereto—say on the left hand—Number 2, and so on with the remainder of the plates in the drum, following in the same direction.

"In operating my improved camera, I turn or revolve, or partially revolve, the drum, which has been previously supplied with prepared glass plates, by means of the finger placed over the dial plate, and a ratchet wheel and spur thereunder, until the said finger points to or is over Number 1 on the dial plate, when the focussing glass is in position behind the lens, and directly opposite the coloured glass in the box and the narrow opening in the drum, on looking through which coloured glass and opening so placed in line the picture is seen on the ground glass, and the apparatus is ready for focussing. When the focussing is completed, I close the slide behind the lens, and move the finger to Number 2 on the dial plate, which brings a prepared glass plate into position in the exact place occupied by the focussing glass, when it is ready to receive the image or picture, as previously seen on the focussing glass. In this way the whole of the prepared glass plates in the drum are, in succession, brought before the lens, and receive an impression or picture.

"When different views are required on each of the plates in the drum, after taking the first view as previously described, the finger and ratchet wheel are again turned round to Number 1 on the dial plate, when the focussing glass is again behind the lens, and the apparatus is ready to focus another view; when this is arranged, the drum is turned until the figure points to Number 3 on the dial plate, so as to present another prepared plate behind the lens, and the second view is taken, and so on for the remainder of the said prepared plates in the drum, the sections on the drum serving the place of the dark slides at present used.

"My apparatus may be made in different forms, the main or leading features being retained in each case. For example, for a camera for the studio, where only one or two plates are required at one time, the 'drum' may be only a quadrant, or one-fourth of a circle or polygon, wherein the plate or plates are placed, leaving an adjoining quadrant an empty space, so that as the views are taken they are turned into the said empty quadrant or space. For a stereoscopic camera, the drum is fixed to revolve on a horizontal axis, the other parts being formed as previously herein described, where the drum revolves on a vertical axis or on pivots.

"My improved revolving camera is especially adapted for taking small views to be afterwards enlarged, and for taking 'negatives' for producing transparencies for the magic lantern; also for taking views in streets, and of processions, and the like, as from thirty to forty views can be taken in a few minutes.

"The camera may be of any size or dimensions, and can be produced at less than the present cost of similar articles, and be more durable. It may be made of wood, tin, brass, or other suitable material which will not warp or be otherwise injuriously affected by variations of climate. It may also be made of paper for a toy camera, with a bull's-eye lens to exhibit small transparencies. Its construction being exceedingly simple, it cannot easily get out of order. It is very compact, portable, and light, always ready for use, and is, therefore, very suitable for tourists in taking stereoscopic and other views, cards for albums, and the like."

PHOTOGRAPHIC USE OF PLATINUM AND IRIIDIUM.—Salts of these metals are, according to Mr. Willis, in the *Polytechnisches Notizblatt*, sensitive to light. If paper be floated on a solution of double chloride of potassium and platinum, or iridium, then dried, again immersed in a solution of nitrate of lead, dried a second time, and finally washed over with an acid solution of oxalate of iron, a sensitive surface results, on which images may be printed under a negative. They require development with a hot solution of oxalate of potash, which brings them out of a rich black colour.

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WHITE ENAMELLED PLATES AS A SUBSTITUTE FOR OPAL GLASS.

A NOVELTY which possesses much promise has just been introduced in the United States. It consists of a ferrotype plate with a perfectly white enamelled surface, intended to take the place of porcelain or opal glass as a basis for a collodio-chloride of silver prints. The American journals speak in high terms of the results as very beautiful, and the great advantages over glass scarcely require enumerating to be appreciated by photographers. The plates are thin, light, not fragile like glass, easily cut like paper; unlike glass, they are not rigid, and are therefore less likely to injure the negative in printing; and they will doubtless be less costly than glass. The surface is said to be very delicate, and of a pure white. There is one point in which it is probable they will scarcely equal pictures on porcelain in beauty. The surface will necessarily be opaque, and hence the peculiar diaphanous effect, which is an especial charm in the photograph on opal glass or porcelain, due to the semi-transparency of the material, must necessarily be wanting.

But there is another point of considerable importance upon which we feel bound to suggest a caution. Our American contemporaries speak of the prints as of undoubted durability; and the assumption, in the absence of experience, is a fairly legitimate one. But, although the *Nonpareil* plate, as it is termed, is a novelty, we have sufficient experience to interpose a doubt. About ten years ago, soon after we had perfected the collodio-chloride process sufficiently to justify us in giving it to the public, we sought about for various substances with fine white surface upon which the prints might be produced, the sensitive collodio-chloride emulsion lending itself to a variety of novel forms of printing. One of the first things which occurred to us as suitable was the ferrotype plate, if it could be made with a white enamelled surface in place of a black one. As this experiment was not easy to try, we thought of another substance somewhat analogous: we obtained some tablets of papier maché with a white enamelled surface, which would be produced, we apprehend, in a manner very similar to the white enamelled surface on a ferrotype plate. The results were in many respects very charming, but there were one or two drawbacks. We found, on more than one occasion, that the whites of the finished picture darkened somewhat in sunlight, and further experience suggested a cause: we found, in some cases, when we cleaned off the film in case of an unsatisfactory print, that a faint image had been formed on the enamelled surface itself beneath the film of collodion.

This showed that an actual combination had been formed between the free nitrate present and the white enamelled surface. Whether this combination were formed with the resinous substance in the varnish which forms part of the enamel surface, or with the white pigment mixed with it, we cannot say; but a combination which darkened under the action of light, and which was not easily removed by the action of the fixing salt, was clearly formed, and such a combination is clearly inimical to permanency. Another incidental difficulty once occurred. The ether and alcohol in the collodio-chloride, and the heat of direct sun printing, on one occasion sufficiently softened the surface to produce adhesion, and we found tablet and negative in such perfect contact that they were not separated without the destruction of both. This latter misfortune—possibly the former one also—was probably due to the enamelled surface being less perfectly finished in the few tablets which were prepared expressly for our experiments than they would have been in ordinary manufacture. Possibly neither risk may be found in the *Nonpareil* plates; but the possibility should be noted, and so serious disappointment possibly avoided. We hope that our caution will prove needless with the new plates.

THE ALBUMEN AND BEER PROCESS AND THE RECENT TRANSIT OF VENUS.

It will interest all dry-plate workers to learn that the albumen and beer process, given by Captain Abney in our YEAR-BOOK for 1874, has proved a complete success in very critical circumstances, yielding a large series of admirable negatives of the progress of the late transit, without any failures. Captain Abney—who has just returned from Egypt, where, as our readers know, he was in charge of the photographic observations of the expedition stationed at Thebes, and secured the greatest possible success—is in every way satisfied with the behaviour of the plates in question, some of the finest of the results having been secured on plates prepared in England in August, exposed in the month of December, and developed shortly afterwards.

The plates were prepared with collodion containing equal parts of bromide and iodide, the proportions being three grains of iodide of ammonium and three grains of bromide of cadmium to each ounce of collodion. They were prepared precisely according to the instructions given in our YEAR-BOOK. The development was effected by means of a modification of Col. Stuart Wortley's strong developer. Captain Abney used a solution containing twenty grains of pyrogallio acid and two minims of liquid ammonia to each ounce of water, and no bromide or other restraining agency. When the image was fully out, the developer was returned to the cup, and about twenty drops of a sixty-grain solution of citric acid added, together with two drops of a twenty-grain silver solution. The solution was again applied to the plate, which rapidly acquired sufficient intensity from the deposit of silver. The negatives are of very fine quality: fine in deposit, delicate in gradation, and possessing great brilliancy. The especial formulae and proportions were selected as best suited to the special astronomical work for which they were designed, in which the exposure did not exceed one-seventy-fifth part of a second; but Captain Abney believes that the same plates and treatment would be found to give good results for almost all kinds of work. As we have said, they never failed. The only difficulty ever experienced arose from the presence of dust, which at times pervaded and suffused everything and every place, and was, of course, detrimental to perfect cleanliness in negatives.

TOUGHENED GLASS FOR NEGATIVES.

A DISCOVERY has recently been made in France, which, if it should prove equal to its promise, will be found a

boon of great value to photographers. There is no misfortune in photography, perhaps, more mortifying than the breakage of a fine negative in the midst of demand for prints, and it is an accident that, in spite of the greatest care, will occasionally happen. A discovery whereby the fragility of glass could be entirely removed would be one of the most valuable contributions to science which can be conceived, and it is at least a step in this direction which has just been secured: a means of making glass comparatively tough without destroying its transparency has been discovered. We give the details just as we find them in the *Times* of a recent date:—

"It has long been known that when glass is heated to redness, and kept at that temperature for a considerable time, its physical properties are changed in a remarkable manner. Thus it becomes opaque or feebly translucent, much harder and tougher, and somewhat like porcelain in appearance. This change is termed 'devitrification,' and is caused by the conversion of the glass into a confusedly-crystalline mass, of which sections are beautiful objects when seen with a microscope in polarized light. The subject was investigated by the renowned French philosopher, Réaumur, early in the last century; and to objects of devitrified glass the name of Réaumur's porcelain is usually applied. Such objects are exhibited in the Museum of Practical Geology in Jermyn Street. It has been reserved for another Frenchman, a gentleman farmer, to discover the singular fact that when glass is heated to redness and then cooled or annealed in oil its toughness is greatly increased, or, what is equivalent, its fragility is greatly diminished, while its transparency remains the same. Thus, suppose a rectangular pane of glass placed flatwise and supported on two of its opposite edges to break when a given weight is allowed to fall upon it—say from the height of two feet—it would, after having been toughened in the manner above stated, resist the same weight falling upon it from the height of six feet or eight feet. It is strange that, although glass has been manufactured during the last two thousand years, yet such a simple and probably very important fact as this should only recently have been found out, and equally strange that the discoverer should be a gentleman farmer. The foregoing information on the new process of toughening glass is given on the authority of Mr. C. W. Siemens, F.R.S., who is well known in connection with telegraphy and the furnace which bears his name. His brother, an eminent glass-maker at Dresden, has tried the process, and pronounces it to be 'certain and unquestionable.'"

METHYLATED ALCOHOL IN PHOTOGRAPHIC MANIPULATIONS.

At a recent meeting of the French Photographic Society, M. G. Noel, an amateur, called attention to the advantages that may be derived from the employment of methylated alcohol, or wood spirit, in the operations of developing and intensifying the image. The cost of methylated spirit is, of course, much less than that of the pure alcohol, being only about a fifth of the price; but this is not the main point. M. Noel states that by using wood spirit in his developer he is able to reduce the exposure of the plate in the camera very considerably—from fifty-eight seconds to eight, or even six, he tells us.

M. Noel's formula for preparing his developer with methylated spirit is the following:—

Water...	...	...	300 grammes
Ammoniacal sulphate of iron	15	"	
Glacial acetic acid	8	"	
Methylated spirit	15	"	

He affirms that a developer thus composed may be used with confidence with very short exposures, and afford results quite equal to those given by an ordinary developer

with a prolonged pose. In compounding his intensifier M. Noel also uses methylated spirit, making up his solution as under:—

Water...	...	...	200 grammes
Pyrogalllic acid	...	...	60 "
Citric acid	...	...	60 "
Methylated spirit	...	...	10 "

M. Noel has such confidence in both these solutions, that he has ceased to employ any other in his photographic work.

Correspondence.

RE "SENEX," THE EDITOR, AND SECRET PROCESSES.

SIR,—I trust you will permit me a few words in reply to "Senex" and yourself. "Senex" is perfectly right when he says of me that I am not aware I "confound two distinct things." When "Senex" reflects upon what the wealth of a nation consists of, he will see that information forms no inconsiderable portion, while money is not wealth, but simply the measure thereof; thus information and money are not so wide apart as he appears to place them.

However, let us take his new way of putting it—the way I was so stupid as not to see: "Freely ye have received information, freely give information." Well, how about those who have no information to give? In this case you would have men who are capable of original investigation freely giving and receiving information from those of equal capacity; in short, it would be simply an exchange, and the noble army of incapables receiving, and giving nothing in exchange. Truly this is an equitable arrangement!

However obtuse I may be, I certainly never argued that because "Archer, &c., gave freely, process-mongers should receive money from the present generation of photographers." This is such a novel idea that I consider it worthy, and intend to insert this original bit of "Senex" in the exercises given in the Appendix to Whately's Logic. However, I would say to those who may have valuable information, and the result of their own investigation, to reflect upon the magnificent rewards given to such men as Archer, &c., before taking the advice of "Senex."

And now for the "remainder of W. E. B.'s illogical letter." In Blair's amount I was in error; my file of *News* being at my house some eighty miles away, I could not refer, and spoke from memory: this you will excuse. In Archer's case I was right: compare £747 with the £1,000 asked for an enamelling process (the annuity of £50 is the bounty of the nation, and not the profession); compare Goddard's works with £500, asked for the formula of a ready sensitized paper. These instances show what value commercial men place upon small work. By a similarity of reasoning, what would be the value of the works of Archer, Blair, and Goddard? In the main I was right when I said a couple of thousand pounds would cover all that the fraternity has ever given to these early pioneers. And now let photographers lay their hands on their hearts and say they have done to these men as they would have others do to themselves. Why, Mr. Editor, if you were to die, poor photography would let the workhouse officials dispose of your remains.

I still think the schoolmaster argument sound; but there is a peculiar ambiguity in the word "new." There is a sense in which the instruction of the teacher is new, and there is a sense in which it is not. Which of these meanings are we to use?—that is, if we are further to discuss the matter by my undertaking to show that the teacher and so called process-monger are alike.

As you appear to misapprehend me, I may say, once for all, I do not pretend to defend, nor have I any sympathy with, any process-dealer who makes false representations.—Yours, &c.,

W. E. B.

Halifax, February 6th.

SELLING AND GIVING IMPROVEMENTS IN PHOTOGRAPHY.

SIR,—There is an error entertained by many, in connection with the history of photography, which has been so often repeated that it is now commonly regarded as a fact. It is so definitely stated in the otherwise able letter signed "Senex," in your issue of the 28th ultimo, that I am tempted to offer a correction. "Senex" states what has often been stated before—namely, that almost every great discovery and great improvement in photography has been given freely to the public. This, I venture to say, is a very decided error; and although the task is a somewhat ungracious one, I will recount a few facts in proof of my assertion. It is a fact that almost every great discovery and improvement in photography has been protected by patent, instead of having been given to the public. Let us look to the record.

Daguerre, who received a handsome pension from the French Government in consideration of giving his discovery freely to the whole world, notwithstanding this secured a patent in this country.

Fox Talbot patented his Calotype process, as well as a number of less important inventions.

To Scott Archer there is little doubt the credit of discovery of the collodion process belongs; but the fact that the process grew out of an attempt to improve the surface of paper with collodion, all the steps of which were familiarly known to many persons, and the fact that prior suggestions and experiments with collodion had been made, prevented the completed discovery from being patentable; but Mr. Archer patented immediately afterwards a smaller thing, to which his claim was safe—namely, the use of gutta-percha for transferring the negative film.

Poitevin, Fargier, Swan, and Johnson, all patented their great discoveries in connection with carbon printing, and a number of others patented minor and less important novelties connected with carbon processes.

Woodbury patented the process connected with his name, and has also patented a number of minor inventions and improvements.

The number of patents taken out for real or supposed photographic improvements is very large indeed, extending, I believe, to some thousands; some for real discoveries or inventions, some for valuable improvements, and a still greater number for things which were old, unimportant, or worthless. In all cases the labourer is worthy of his hire, and I do not grumble when I see a really good thing protected by patent, as, besides giving the real inventor a chance of remuneration, it also affords the public the guarantee of excellence which is only secured by some one person having an interest in making the best of the process; whereas it often happens, when a thing is given to the public, it is like a piece of public land: as everybody may cultivate it, no one person does so. A patent for a good thing is a public benefit, whilst a secret is a public evil.

Nevertheless, whilst I deny that the majority of great discoveries and improvements have been given freely to the public, I do not deny that a spirit of genuine liberality has prevailed amongst photographers as to points of improvement in practice, and sometimes even in relation to discovery. I may mention the collodio-chloride process, given by the Editor himself; the collodio-bromide process, by Messrs. Sayce and Bolton; the great improvements in that process by Col. Wortley and others; the alkaline development process, which, if not invented by Major Russell, was well worked out by him, and freely given; a score of points of improvements in practice of such men as Robinson, Blanchard, Abney, Bovey, Fry, Croughton, and others, of which I might almost take the index of the Year-Book of Photography for the last few years as a muster-roll. If every minor improvement made by such men were preserved as a secret, and sold at a price, a revolution would be effected in the spirit and relations of photographers of a very undesirable sort. It is to the minor improvements

freely made known in societies and journals that so much real progress is due. Great discoveries and great improvements can be, as they have a right to be, easily protected by patent; but it is a bad sign of the times when small improvements, insufficiently novel or insufficiently important for protection by patent, become the subject of petty huxtering. If, however, such things may, in some cases, be with propriety tolerated, at least let photographers avoid dignifying the practice by appointing committees to report upon their claims. Buying a secret must always resemble making a venture in a lottery; let those who are prepared to stake the amount, take all the risk without grumbling; and remember that whilst it is a pleasant fact to contemplate that many photographers have been very liberal in aiding their brethren, that fact does not give photographers generally a vestige of claim to be taught everything for nothing.—Very truly yours, Y.

RENOVATING THE NITRATE BATH.

SIR,—I cannot agree with Mr. E. Shayler that it is the province of societies to investigate and report upon processes offered for sale. Indeed it is the aim, and very properly so, to avoid all connection with the commercial side of photography. But some years ago the South London Society appointed experimental committees, and I remember that some very useful information was contained in their report on dry processes. Why not carry out that idea to report on questions of the day? For instance, making the nitrate bath and keeping it in order has recently been brought under attention. I have never had any difficulty in doing this, but I should not object to pay a guinea or two to anyone who could teach me a better plan, or I would gladly contribute to an experimental committee fund. In the meantime, if those of your readers who are willing to "give information" would do so, it would afford material for the examination of such committees. My method is as follows, and is based upon hints and information given many years ago by Mr. Rejlander, and Mr. Blanchard in the News.

As I never make a new bath, but keep constantly renovating one I have had in use for years, I need not speak of the new bath, which generally works well. I keep two baths constantly going, which I use on alternate days, and sometimes change during one day of hard work, as I believe in rest for a bath. The moment a bath shows signs of being out of order, I pour it into an equal quantity of distilled water, add a few drops of a solution of carbonate of soda, and place it in a glass barrel on a shelf near the light, where it remains some weeks or months until required. I always keep a bath, when not in use, in the light, which is constantly aiding it to throw down impurities. The barrel is covered with a piece of gauze or muslin, and there is constantly a slow evaporation going forward, which aids in removing ether and alcohol. When I require any of the solution for use, I withdraw it from the barrel by means of a glass tap about an inch from the bottom of the barrel, and thus escape both sediment and scum. I make up the strength with crystals of nitrate of silver, and rarely find any difficulty in getting good results at once. Now and then I had boiling necessary, but not often; it is, however, always efficient. I scarcely ever add nitric acid to the bath, but when necessary I add a little tincture of iodine to the collodion instead.—Very truly yours,

AN OLD PORTRAITIST.

PRESERVING GELATINE.

SIR,—It may be an advantage to those who are experimenting with gelatine, as well as those who require an antiseptic agent for other purposes, such as the preservation of albumen, paste, &c., to know that salicylic acid, used in very small quantities, preserves organic matters from decom-

position of any kind. A solution of gelatine, ten grains to the ounce, has been now standing several weeks on my kitchen mantelpiece, sometimes fluid, always tolerably warm, yet kept perfectly unchanged by one-eighth of a grain of salicylic acid per ounce.

Salicylic acid is an extract from coal tar, and is one of the constituents of carbolic acid. It is without odour and almost tasteless, as well as non-poisonous. It is very slightly soluble in water, but more so in glycerine or oil, and produces, so far as I can see from my experiments, no chemical effect injurious to the reactions involved in photographic operations. This acid has been known for a long time, and was extracted from the oil of wintergreen at a rate too costly for its use in any ordinary industrial process, but is now made artificially by a process discovered by Bothe, by uniting carbonic and carbolic acids together in the presence of caustic soda, by which means it has been so reduced in price as to become available for many common uses. It is sold by Hopkin and Williams at two or three shillings per ounce, whereas it once cost £10, and only a few months ago I paid twelve shillings.—I am yours truly,
W. J. STILLMAN.

THE COST OF EXHIBITIONS OF THE PHOTOGRAPHIC SOCIETY.

DEAR SIR,—There was one statement made from the Chair at the Annual Meeting of the Photographic Society, touching the recent exhibition, which was not, I think, rendered very clear. When Mr. Hooper was deploring the cost of the last exhibition, the Chairman interrupted him with the remark that it had not cost the Society so much as the previous one, for whereas £98 was expended in 1874, as much as £128 (I believe these were the exact sums) was spent in 1873.

This statement was true enough, so far as it goes, but it was scarcely a business-like way of viewing matters, for although in 1873 as much as £128 was expended, the Society received in return £130 from admissions, sale of catalogues, and advertisements. Thus in 1873 the Society was actually benefited to the extent of a pound or two by its exhibition; whereas last year, a loss of about forty pounds resulted to the Society from its exhibition. It was a pity, I think, that the Chairman did not make this clearer to the meeting, especially after he had taken the matter out of Mr. Hooper's hands.—Faithfully yours,

H. BADEN PRITCHARD.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE annual meeting of this Society was held in the Architectural Gallery, Conduit Street, on the evening of Tuesday, February 9th, Mr. J. SPILLER, F.C.S., in the chair. The minutes of a previous meeting were read and confirmed, and the following gentlemen duly elected members of the Society: Mr. W. D. Bosanquet and Mr. M. P. Tench.

The CHAIRMAN read the Annual Report of the Council, which contained a memoir of the late O. G. Rejlander. The report will appear in our next.

Mr. WERGE wished to ask three questions: first, he wished to know who was responsible for the offensive circular sent out to members whose subscription had not been paid for the coming year, informing them that until it was paid they could not receive voting papers; second, why the voting papers were marked with certain initials; and third, why the marks on these papers were different.

The SECRETARY, at the request of the Chairman, answered that the circular was simply an extract from the laws of the Society. He was only the servant of the Society, to obey its rules; and he saw no means of doing this except by issuing the circular he had sent out. As to the marks on the paper, they were merely his initials, as a guarantee that the papers were sent out by himself. There was no difference in the marks, except in one case, in which

a star was attached because a doubt existed as to whether the member to whom it was sent had paid his subscription.

Mr. WERGE had seen three or four papers all marked differently, and it certainly opened a door to the suspicion that the secrecy of the ballot might be violated. The proper plan to secure certainty would have been to stamp each voting paper with the stamp of the Society. He still thought the circular offensive, and the proof that it was so was found in the fact that several old and esteemed members of the Society had resolved to resign in consequence. Country members were put to especial inconvenience and disability, and the course was, he thought, most unfair and impolitic.

Mr. STILLMAN did not consider the circular offensive. Some people were annoyed when a tradesman sent in his bill. As for any marks on the voting papers, they could not be used, as they were all delivered sealed to the scrutineers, who burnt them as soon as they had taken the numbers.

A MEMBER said that he had paid his subscription, and had received the offensive circular.

Mr. PRITCHARD said the duties were new ones, and the Secretary was new to the duties, which had been unusually heavy, and some allowance should be made. Mr. HOOPER, Mr. BIRD, and Mr. DAVIS briefly spoke to a similar purpose.

The SECRETARY accepted the responsibility as it stood, and, except in relation to the accidental sending of a circular to the member who had paid, he contended that no other course was open to him.

The report having been duly passed and adopted,

The TREASURER read his report, from which it appeared that the balance to the good of the Society amounted to upwards of £334.

Mr. HOOPER noted that the exhibition had been a greater cost to the Society this year than the previous year, and suggested that it would be important to try to make the exhibition as attractive as possible, without increasing the expenses.

The CHAIRMAN said that the expenses had been rather less, but unfortunately the income had been less in still greater proportion, so that the results to the Society were not so favourable.

Mr. HOWARD suggested that in no manner could the funds of the Society be better spent than in the maintenance of their annual exhibition.

The TREASURER's Report having been received and adopted, and votes of thanks to the retiring officers passed,

The Scrutineers' Report was received, from which it appeared that only 110 votes had been received. The elected officers were as follows:—

President—J. Glaisher, F.R.S.

Vice-Presidents—J. Spiller, F.C.S.; V. Blanchard; Captain Abney, R.E., F.R.A.S.

Treasurer—R. W. Thomas.

Council—Messrs. England, F. Bedford, Sir C. Wheatstone, W. S. Bird, Professor Stokes, J. H. Dallmeyer, R. J. Friswell, S. Fry, W. Woodbury, J. W. Swan, J. Hughes, W. J. Stillman, F. Howard, J. E. Mayall, W. Mayland, Major Malcolm, S. Davies.

The CHAIRMAN offered a few words of comment and explanation, in which he apologized to Col. Wortley for having nominated him without consulting him, and remarked that by doing so, and practically running two liberals against one conservative, they were naturally beaten.* He referred to the circumstances of disturbance when he took the position of Chairman, and expressed his willingness to serve the Society in any office.

Mr. BLANCHARD expressed his wish not to accept the office of vice-president, but on being asked to reconsider his decision, withdrew his resignation.

A slight modification in Law 9 was passed, referring to the necessity of candidates for membership being submitted to the Council previous to ballot in the meeting, and notice was given of motion to alter the clause in Rule 11, in relation to voting, by Mr. Hooper, at a meeting to be made special at the close of the March meeting. The object of the alteration proposed by Mr. Hooper is to entitle a member to vote who has paid his subscription for the past year, instead of, as at present, his subscription for the year just commencing.

* Two correspondents have written to point out that as, out of the 110 votes cast, Mr. Glaisher received 65, leaving only 45 to be divided between the other two candidates, it was unfair to suggest that Mr. Glaisher's election was due to any division of the votes, as he must have had a majority of 20, even if only one other candidate for the presidency had been nominated. It is sufficient to note the matter here, without printing the letters and comments of our correspondents.

Mr. YORK then showed by means of the lantern some negatives of the Transit taken by Mr. Bruton, of Cape Town.

The proceedings then terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held in 5, St. Andrew Square, on the evening of Wednesday, the 3rd inst., the President, Dr. THOMPSON, in the chair.

The minutes of the previous meeting were read and approved, and Messrs. James J. Fulton, Alexander Porteous, and W. Hannah were admitted ordinary members.

The PRESIDENT laid on the table an album containing a large collection of pictures by the late Mr. O. G. Rejlander, kindly lent by Mr. Constable, and a fine collection of mounted prints by the same artist, lent by Mr. Elliot. He said that, before proceeding to the ordinary business of the evening, he thought it necessary briefly to allude to the loss which the whole photographic world had sustained by the death of Oscar Gustav Rejlander, which had taken place since they last met. He had not the honour of a personal acquaintance with Mr. Rejlander, but from the testimony of those who knew him best, he was certain that his acquaintance was one of which any man might have been proud. For the talent, industry, and perseverance of their lamented friend he had, in common with all who valued art, the highest admiration, and he was sure that he only echoed the feelings of the meeting when he said that in him photography had lost one of its brightest ornaments, and art one of its truest sons. Mr. Rejlander, it would be remembered, was one of the earliest pioneers in the effort to show what photography was capable of doing, and one of the first to raise it from the mere mechanical, and place it side by side, as a not unworthy sister, with painting. His services were given just at the time when they were most required. Ordinary photographic manipulation was so simple, and it was so easy to produce some kind of image on the collodion film, that men of all classes rushed into the rank of "photographic artists," most of them with no art education, and many with no education at all. The work of many of those men degraded photography to such an extent, that even at the present day it had not quite recovered from the shock. Sitters as a rule have sufficient vanity not to like to see themselves represented as worse-looking than they really are; and this was just what, at one time, the art was caused to make them. At this crisis Mr. Rejlander and some others came to the rescue, and, by patient, persevering industry, guided by art knowledge and art education, showed to what high flights photography was capable of attaining, and how pliant it could be when handled by men of refined taste. Mr. Rejlander was a most industrious man, and had left behind him a large collection of valuable works, of which those on the table were excellent examples. He would recommend photographers to study them carefully, as he was sure they would get much benefit therefrom.

Mr. JAMES ROSS, in answer to a request from the Chairman, said: I feel confident that all present will agree with me when I say that the lamented death of O. G. Rejlander has left a vacant space in the ranks of photography which few, if any, are able to fill—indeed, I have never met with any photographer who did not willingly bear testimony to the artistic excellence of his pictures. We can all tell a Rejlander at a glance, not from any particular mode of lighting, or style of background, but from the impress of his own genius, which is, more or less, stamped upon them all. My own admiration of his works has all along been so sincere and so ardent, that somehow I have remained entirely blind to his alleged defects as a manipulator. There are a few gentlemen now present who had the pleasure of meeting Mr. Rejlander at a supper party given in his honour some years ago, and who may remember that the late Mr. Clark—himself a master of manipulation—in the course of a highly eulogistic speech, made the remark that Rejlander was a far better manipulator than his friends gave him credit for. This was the simple truth, for it must never be forgotten that many of his subjects precluded the hope or chance of perfect manipulation. For instance, a negative of a boy walking on his hands alongside a London omnibus, could hardly be expected to develop so smoothly and equally as a negative of a gentleman sitting comfortably on a photographic chair, supported by an iron pillar, where the necessary time can always be given; and to those who say that nothing should be done by photography but what can be done to perfection, I have only to reply that this idea, if acted upon, would stop all progress, and, in the opinion of many, the art of photography, in every shape, would have to be abandoned. Besides, is the fond Northern heart not

to be gladdened by a true representation of a baby's very pleasant, although very evanescent, smile, merely because the background may not be quite so speckless or spotless as it should be? And have we not, amongst these of ladies and gentlemen before us, ample evidence that although Rejlander invariably aimed at something higher than fine manipulation, none the less, in the mere mechanical part of our art, he was a workman that needed not to be ashamed of his work? Probably you have all seen the biographical sketches that have appeared in the journals, as well as the letter in the *Scotsman* by his kind friend and patron, Mr. Constable. The writers all bear witness to his undoubted genius as an artist, as well as to his very genial and loving nature as a man. Mr. Constable has kindly sent me several letters written by Mr. Rejlander upon his death-bed; very, very touching these are. There is one, likewise, from Mrs. Rejlander, containing an account of her husband's funeral, the expenses of which will, I fear, leave but a small balance at her banker's account. A few friends, however, in Edinburgh are endeavouring to dispose of Prince Albert's picture by subscription, for the purpose of helping the widow in her affliction, which is really the true and proper way to honour the memory of our departed and lamented brother, O. G. Rejlander.

Mr. W. NELSON said: It has been often said that photography cannot attain to the position of a fine art, as the photographer can only reproduce what he sees. Well, that is in one sense true, and the work of any particular photographer will be work of art, or not, just in proportion to the little or much artistic feeling that it has in it. The photographer with a true knowledge of art will conceive the picture in his brain, train and manipulate his model to be what he has so conceived, and then make his camera reproduce the conception. This was the way Rejlander set about his work, and the result—those magnificent pictures on the table—was beyond all praise. If those were not art, then he was sorry for art, and had no doubt that some of those who talked most learnedly about art might learn much from Rejlander's works, especially of the wonderful command of light and shadow, and effected simplicity of composition. Rejlander trusted little to upholstery, and less to retouching, and, without either, had managed to leave to the world a legacy of art photographs that would be appreciated as long as there were men and women in it of cultivated taste.

Dr. HUNTER (late Superintendent of the School of Design in Madras) said that he had got a greater treat in the examination of Rejlander's photographs than he had ever got before. There were four or five on the table that might fairly rank with the finest work of any of the old masters in all good art qualities. Mr. Rejlander has evidently looked into the minds of his sitters, and even managed to bend them to the direction in which he wanted them to be, and so had in all his pictures, not merely given a faithful likeness, but also made the composition such that there was a story to tell, and much suggestion made. He had also studiously kept himself out of view, and so given rise to the continuous variety which is so characteristic of the whole of his work.

Mr. NORMAN MACBETH said that he did not anticipate such a treat as the examination of the pictures on the table had been. He had met Mr. Rejlander in London, and could heartily endorse all that had been said of his winning ways and kindly genial disposition. He was courted by men of all ranks, and nowhere more at home than in the society of men of the highest art fame. No one could be in his company for many minutes without feeling that he was in the presence of an artist in the truest sense of the term. Photography had before it a wonderful future, if photographers would only educate themselves as Rejlander had done. He had set before himself an ideal to which he had worked up, and that with such success that some of the compositions could not have been better treated by even the best of the old masters. Photography in portraiture could only rise to art when the photographer brought a thorough knowledge of art to bear on his treatment of his model. This Rejlander had done, in a way which was worthy of all honour and patient study.

Mr. A. MACKAY wished to corroborate all that had been said in favour of Rejlander and his works. It amply proved the truth of his remarks in his paper read at the last meeting of the Society, where he urged photographers who wished to be more than mechanics to study in our picture galleries. Rejlander had done this to some purpose, as his works bore ample evidence. He was indeed a true artist, and so produced works in every sense artistic.

On the motion of Dr. JOHN NICOL, it was remitted to a committee to prepare a minute, expressive of the sense of the loss

that the members generally felt in the death of Mr. Rejlander, and that a copy should be sent to his widow.

Mr. TURNBULL then read a paper on the "Various Styles in Portraiture" (see page 74).

Mr. ROSS entirely agreed with Mr. Turnbull in objecting to retouching. He was glad to see, however, that the practice was gradually being abandoned, or, at least, those who hitherto had done most in this way were finding out that it would be better to do less. A really good negative did not need it, and operators should strive rather to make perfect negatives than trust to get their omissions partly cured by the art of the retoucher.

Mr. A. MACKAY thought Mr. Turnbull's paper was written in a capital spirit. If photographers would only aim at educating themselves, and then make the camera obey their wishes, there would be little need for retouching, and photography would go on with rapid strides to perfection. Mr. Rejlander owed nothing to retouching, and yet his work was such as to make even the best envy him.

Mr. W. NELSON had listened with pleasure to Mr. Turnbull's paper. He had no objection to retouching so long as the public insisted on it, but he thought the public ought also to be educated to appreciate what was truly good; and when that happy result was attained, the pencil would be discarded, and the art of retouching become a thing of the past.

Mr. ASHER said it was well known that shadows in photographs were generally darker than in nature. The old masters, to whom allusion had so often been made, always took care to throw in a little light into their shadows, and he thought retouching to that extent was fairly allowable, and it might also be legitimate to use it in softening the hard lines, so long as the true texture was not hidden.

Mr. NORMAN MACBETH did not like to appear severe, but he regarded the practice of retouching as beyond condemnation. He would strongly press on the attention of photographers the importance of a more careful study of development. In this he was certain lay the secret of getting a true transcript of the finest effects of nature. Over-development and retouching were equally destructive of that fleshy texture which ought to be the charm of a good photograph. They produced the appearance of marble rather than flesh. It was much better to have a faint indication of freckles than to produce the marble-like appearance which was always a result of retouching. As a proof that retouching was not necessary, he called attention to one of Rejlander's portraits, which had evidently been printed from a thin negative, and which showed most marvellously the texture of the skin, and the anatomy of the face. Another serious objection to retouching, he stated, lay in the fact that after death, the portrait painter was often required to paint a picture from a photograph, and that a good result from such a print was simply impossible.

Mr. ROSS hoped they would all lay to heart what Mr. Macbeth had said. He once got a picture from Rome. It was the first retouched specimen he had seen, and he wished it had been the last. It had no bones, no muscle, no nothing, in fact, that a picture ought to have, and gave rather the idea that the model had been a man of plastic putty, manipulated by a clumsy hand.

The usual distribution of prints was then made by ballot, and Dr. Nicol, the corresponding secretary, intimated that he had received from Messrs. Cussons, of Southport, a supply of their little almanacs; and as there were not sufficient to go over all the members present, he should give one to each of those who had drawn a blank; and he might say that, as each of the almanacs contained two pretty photographs, they would have cause to be well pleased.

Votes of thanks were then given to Mr. Constable, Mr. Elliot, and Mr. Turnbull, and the meeting adjourned.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE ordinary monthly meeting of the Board of Management was held at 174, Fleet Street, on Wednesday, the 3rd ultimo, Mr. SKINNER in the chair. After the minutes of previous meeting had been read and confirmed, Messrs. Steele, Lane, F. Dighton, Banks, F. Stoddard, Patterson, and Miss Jones were duly admitted members of the Association.

The Secretary was instructed to convey the thanks of the Board of Management to those ladies and gentlemen who so kindly and efficiently contributed to the success of the entertainment at the Annual General Meeting. The Secretary was also instructed to get a card of membership printed.

Two applications for relief were presented and considered.

Five pounds were voted for the relief of one applicant, who had been ten weeks out of employ, and had had his daughter and wife ill. For the relief of the other applicant a sum of money was ordered to be sent to a photographer in the neighbourhood, asking him to take a ticket for the destination of the applicant, this course being adopted on account of the unsatisfactory references given.

After the transaction of some routine business, the meeting adjourned.
W. T. WILKINSON.

Talk in the Studio.

LANTERN READINGS.—We have just received from Mr. Frederic York another of his excellent little adjuncts to successful lantern exhibitions, in the shape of a descriptive lecture to serve as a "lantern reading" for a series of slides illustrating the Indian Empire. It will prove very welcome to all interested in lantern exhibitions.

DESIGNS FOR MAGIC LANTERN.—A correspondent of the *English Mechanic*, referring to Mr. Bigg's recent paper on the magic lantern, quoted by our contemporary from the *News*, says:—"Will you permit me, as a mechanic and photographer, to suggest to your readers what I conceive to be a practical way of doing that which is more difficult than it at first sight looks to be, to secure true geometrical drawing on a three-inch circle of glass. I would, were I possessed of a lathe with overhead motion and geometric chuck, take pieces of glass as flat as possible three and a-half inches square, coat them with a black varnish of such consistency as to scratch cleanly, chuck them, and, with a fine-pointed tool, describe the required patterns; thus producing a negative which could be printed from direct. Such pictures I am certain would be—provided the varnish were such as to give a clean scratch—miles in front of anything I have ever seen. Any fellow-reader who could carry out the mechanical and artistic part of the idea, I would willingly assist with the photographic."

CONDIMENTS AND COMESTIBLES FOR THE CAMERA.—A new humorous publication, which is admirably illustrated by John Proctor and other celebrated artists, entitled *Funny Folks*, has the following:—"Households harbouring photographers are likely to become subject to a new danger, and prudent housewives will need to give an eye to the larder and store-closet. An American photographer, the PHOTOGRAPHIC NEWS informs us, unblushingly declared at one of the meetings in which the photographic cabala are discussed, that he had been invading the kitchen, and using tea and mustard—repulsive mixture!—as a preservative for dry plates, which made them very sensitive. How putting such a mixture upon plates could make them dry, and why plates should be sensitive to the pungent compound—for plate is not a misprint for palate—it is impossible to conceive. The plates, we are informed, 'did not keep well, but were worthless in two weeks.' We should think so. If a mixture of tea and mustard were placed on plates before us, they would be worthless in two seconds."

To Correspondents.

THE PHOTOGRAPHIC SOCIETY.—We have received some further letters, on the voting papers and circular, which we do not deem it expedient to insert, but to which we may briefly advert. "M. W.," referring to the discussion at the Society on Tuesday night, says:—"It did not seem to strike the chairman and others that the plan proposed by Mr. Werge was much more conciliatory in character, and quite as simple and efficient, as that adopted. If a voting paper had been sent to every member of the Society, the result would have been every way more legitimate. Such papers sent to members in arrear could have had the envelope marked with a cross, and have been accompanied by a note to the effect that if the member desired to use his balloting paper, he could duly seal it in the envelope, and enclose that, together with a cheque for amount due, to the Secretary, who, erasing or initialing the cross on the envelope, would hand it in, sealed, with all the others received, to the Scrutineers. This would have secured all the secrecy of the ballot, and saved much heartburning and inconvenience." As it is probable that the law will be modified, this difficulty will probably not occur again. Our corres-

pendent's remarks on the initials and the stars he alleges to have been attached to several are better not discussed. "C." asks if the imperfect and irregular character of the voting paper would not be a legitimate ground of invalidating the election. Our correspondent should remember that laws and regulations, although very important, may sometimes be subordinated for the good of the Society. Nothing would be more fatal to the interests of the Society than further squabbling. It will be much better for our correspondent to sink his individual notions, accept the issue, and do his best for the interests of the Society. AN OLD MEMBER and "W." will see we have made a note, in the report, of the nature of the majority. The votes were cumulative, those given to an unsuccessful candidate for the presidency being added on to those he might receive for the vice-presidency, and so on, those for V. P. being added on to those received for the council, provided the candidate were, in each instance, duly nominated to the lower office. The question as to whether any of the papers received were disqualified from any cause we cannot answer. The number of papers accepted was 110, probably about one-third of the members of the Society.

F. W. REYNOLDS.—The examples you send fully confirm our former opinion, that lack of vigour in the negative is the chief cause of lack of brilliancy and depth of tone in the print. Bear in mind, in the first place, that a print which may appear perfect when it leaves the printing-frame will be very poor after tuning and fixing, and that therefore, to appear brilliant and delicate after tuning and fixing, it must appear much too deep when it leaves the printing-frame. To secure a fine deep black tone, it must be bronzed in the deepest shadows, and it may, without impropriety, appear clogged up in the half-tones. A print invariably loses something in depth and richness in tuning and fixing, especially in the latter operation. To meet this reduction, the printing and tuning must be carried sufficiently far. Your print untuned and unfixed is not nearly deep enough, and the tuned portion is not nearly black enough to have any chance of a deep tone after fixation. The untuned portion suggests a fine negative somewhat lacking vigour. The colour is not quite good, and suggests a weak and somewhat acid bath. See that your bath is neutral, or fume your paper. Avoid adding bicarbonate of soda to an acetate bath. It is wrong in principle, and generally bad in effect. Probably, on some samples of paper giving greater intensity, your negative would print much better. Try to obtain a piece of Obernetter's collodio-chloride paper, either from Mr. Bruce, of Dunee, or Mr. Solomon, of Red Lion Square: you will probably get very good effects with it. Some samples of albumenized paper do smell very unpleasantly; but we do not know that any practically bad effects have been found to follow. As it is suggestive of sulphuretted hydrogen liberated from putrefying albumen, it is at least suggestive of evil. Since writing the above remarks we have toned the portion of print enclosed. As we anticipated, it does not acquire a black tint. On pushing it beyond the purple, it passes to a slate tint, simply because there is not depth enough of silver in the image.

Z. DODSON.—We are not familiar with the lens you describe, but we scarcely think that any single lens has been made by the manufacturer in question which will not give a picture more than one and a-half inch long. Write to the maker and ask particulars. 2. Photographs of statuary may be taken with either portrait lens or single combination moderately well stopped down. For makers' names see our advertising pages.

F. H. WORSLEY-BENISON.—THE YEAR-BOOK back numbers all gradually get out of print. We cannot with certainty tell whether we can obtain a copy of 1870 or not, but we will bear your request in mind, and you let know shortly.

DOUBTFUL.—We presume that a gentleman occupying the position you describe would probably be regarded as a public character. 2. You undoubtedly have not a right to issue portraits of such a man for publication without due permission. If he sat to you for the express purpose of publication, and gave you permission, you have, of course, the right; but if you simply took his portrait in the ordinary way of business, you have no right whatever to publish it. 3. You have no legal right unless, as we have said, the gentleman sat to you at your request for publication. In any other case the widow has an undoubted right to forbid publication.

HOPFUL.—On the whole, iron sash bars have probably the advantage over wood in being more durable; but there is a slight disadvantage in being less convenient. For instance, it not unfrequently happens that the photographer wishes to improvise some special effect of light by some special arrangement of blinds or curtains. Wood easily permits this to be done by means of tacks, whilst iron is very much less accommodating. For convenience we should choose wood: for durability, iron. All the proceedings of the Photographic Society are published in our pages. There is no special personal advantage for a person in the country belonging to it beyond the consciousness of supporting the art. The Photographic Society does good in various ways—in holding an annual exhibition, &c.—but its chief advantages are derived by town members, who can attend its meetings, &c.

HENRY SPINK.—The nitrate of silver obtained from boiling down a bath should be quite available for a negative bath; but if you have any doubt, use it for printing purposes, and use fresh silver for the negative bath. Streaks in the direction of the dip under these circumstances are often due to scum on the surface of the solution.

PENSE A BIEN.—It is very difficult to give general advice in relation to all that you contemplate. If you state any point or points upon which you are in doubt, we shall have pleasure in aiding you; but you will see, on consideration, that it is necessary we should have your plans before us before we could offer any opinion or suggestion. As to question B, we cannot give any certain answer. Of course the matter is a delicate one, and can only be determined by trial. Write to any of the gentlemen in question, and try.

J. EASTHAM.—We will write to you.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR JANUARY.

BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven,
36 feet above sea level.

THERMOMETER.				BAROMETER.			Direction of Wind at 9 a.m.	REMARKS.
Date.	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1	28°	32°	34°	29.61	29.54	29.40	W.	Very strong wind all day, with sleet p.m.
2	41	42	38	29.48	29.40	29.39	S.W.	Rain a.m. and p.m.
3	40	45	44	29.34	29.41	29.60	W.	Fair, but gloomy.
4	44	48	46	29.34	29.40	29.21	S.	Rain a.m. and p.m.
5	43	47	45	29.48	29.52	29.56	S.W.	Rain a.m. Gloomy all day.
6	46	48	48	29.62	29.60	29.66	S.	Rain a.m. and at night. Strong wind.
7	46	46	42	29.71	29.73	29.85	S.	Rain a.m. Gloomy all day.
8	41	—	41	29.90	—	29.80	S.S.E.	Drizzling rain a.m.
9	41	44	42	29.70	29.60	29.53	W.	Heavy rain all day, with strong wind at night.
10	44	48	44	29.57	29.55	29.58	—	Rain a.m. and p.m.
11	44	45	44.5	29.61	29.63	29.65	S.W.	Fair, but gloomy.
12	46	48	47	29.66	29.71	29.73	S.	Rain p.m. Gloomy all day.
13	48	48	46	29.73	29.73	29.72	W.S.W.	Rain a.m. Gloomy all day.
14	48	50	48	29.70	29.73	—	—	Heavy rain and strong wind a.m. and p.m.
15	48	48	44	29.40	29.33	29.46	S.S.E.	Heavy rain early this morning and this afternoon.
16	44	45	44	29.31	29.31	29.41	S.	Rain this evening.
17	42	44	44	29.58	29.50	29.49	N.W.	Rain till 1.30 p.m., and again at night.
18	44	45	46	29.39	29.45	29.48	W.	Rain a.m. and p.m. Very strong wind at night.
19	48	48	48	29.30	29.25	29.18	—	Rain showers, with strong wind a.m. and p.m.
20	45.5	47	44	29.29	—	29.10	S.E.	Very fine and sunny all day.
21	36	40	30	29.13	29.26	29.37	N.	Fair, generally gloomy.
22	34	40	37	29.69	29.76	29.68	N.N.W.	Rain a.m. and p.m.
23	41	44	40.5	29.41	29.30	29.28	S.	Rain a.m. and p.m.
24	41	42	42	29.76	28.69	28.65	—	Rain a.m. & p.m. Hail at night.
25	41	44	38	29.05	29.26	29.50	S.W.	Snow & sleet p.m. Heavy at night.
26	36	38	41	29.90	29.88	29.82	N.E.	Rain this afternoon. Gloomy.
27	46	47	46	29.82	29.81	29.78	S.W.	Rain all day. Windy.
28	43	47	44	29.81	29.85	29.84	—	Rain a.m. and this evening.
29	44	46	40	30.07	30.09	30.11	N.	Rain a.m. and p.m.
30	35	41	39	30.29	30.12	30.37	—	Fair, but gloomy.
31	41	43	43	30.25	30.20	30.16	S.	Drizzling rain all day.

From the above observations I arrive at the following:—

	Mornings.	Noons.	Nights.
Maximum temperature observed	48°	50°	48°
Minimum ditto	23°	32°	30°
Mean ditto	42.6	41.7	42.2
Mean of whole	43.1		
Number of days on which rain fell	—	—	25
Number of fair days	—	—	48
Number of fair days on which it was sunny	—	—	1
Number of fair days on which it was gloomy	—	—	4

The mean temperatures of the months of January, 1874 and 1875, have been considerably above the average, and January, 1875, above that of 1874, thus:—

	Morning.	N.	Night.
January, 1874	41.1	43.7	40.7
" 1875	42.6	44.7	43.1
Difference	1.5	1.0	2.4

There was almost a continuous fall of rain during the month; the rain amounting to 4.67 inches, and evaporation to 9.7 of an inch.

Chemical Laboratory, Braystones, near Whitehaven, February 1st.

The Photographic News, February 19, 1875.**PHOTOGRAPHY IN AND OUT OF THE STUDIO.
TINTED DRY PLATE FILMS—FLEXIBLE GLASS—IMPROVEMENTS IN PHOTOGRAPHIC BOOK ILLUSTRATIONS.**

Tinted Dry Plate Films.—It is a circumstance worth noting by those who have little experience in dry plate photography that the tinting of the film, as now practised commercially, has the effect of rendering a longer exposure in the camera necessary. Those, for instance, who have been working with backed uranium plates, and giving exposures of perhaps a few seconds only, will be considerably surprised to find, when developing a batch of films that have been tinted, that the pictures secured are considerably under-exposed. One cannot, it seems, attain one advantage without the sacrifice of another, and if we get rid of the objectionable backing, then longer exposure must needs be given. All things considered, it is the tinted film we ourselves prefer, by reason of its greater cleanliness and less liability to become spotted by dust particles, which are most difficult to avoid when one has to do with a layer of loosely attached pigment on the reverse side of the plate. The tinting of the film, as everybody knows, is for the purpose of rendering it more opaque, and thus avoiding the annoyance of the phenomenon called blurring, which is often met with when the light can readily penetrate the film. If the coating of collodion could be made dense enough without the admixture of colour, such a course would be, of course, preferable, for it would then be unnecessary to sacrifice any of the sensitiveness of the plate, or have recourse to the employment of backing, unless, indeed, we can make some practical application of Dr. Hermann Vogel's interesting experiments, which have proved that, under certain circumstances, the sensitiveness of bromide of silver is materially improved by the addition of colouring matter. The day may come, perhaps, when we shall have dry plates fitted for all kinds of services at the disposal of the photographer; thus when he desires to depict an image in which there is a large amount of green light, he will employ a film which absorbs these particular rays, and is especially sensitive to green; when he has a red subject, he will make use of a film that absorbs red rays, and so on. If we can only get the colouring matter we now add to dry films to fulfil a double object, to render the collodion at once more impenetrable to and capable of absorbing light rays, as Dr. Vogel has been able to do in his experiments with the spectrum, then, indeed, we shall be making a great step of progress in the matter. In the meantime, however, we would warn those who are not practised in dry plate photography to be careful to give good exposures to plates which have been tinted with any colouring matter.

Flexible Glass.—There seems some chance of a great photographic problem being solved, if what we have been recently told in the *Times* and *Athenaeum* should turn out to be true. For a long time past we have been looking for a substitute for glass, for a basis for collodion, which, while as rigid and transparent as that material, shall not be so brittle and fragile. The Vienna Photographic Society deemed the subject of such importance that two years ago they offered a gold medal and a sum of money to anyone who should bring forward a thin transparent film, tough and flexible, suitable for coating with collodion and receiving an image in the camera. Many experiments have been made to secure such a material. Gelatine has been used in every form and variety, and although most delicate and insoluble sheets may be obtained with it, these are found exceedingly liable to be torn, and also to swell and to absorb moisture in a damp atmosphere. Collodion mixed with castor oil, or some such material, is little better, for although it affords a hard, flexible mate-

rial, the same is endowed with little strength. Indeed, the only substitute of the kind we have for glass are sheets of mica, and these, as photographers know, are at times by no means satisfactory. But now we hear of a discovery which seems likely to be a great boon to photographers. We are told that a glass worker at Dresden, a Herr Siemens, brother of Messrs. Siemens, the celebrated firm of telegraph engineers in London, has been successful in producing a tough, malleable glass, which can be bent without breaking, and which may be produced in the thinnest sheets without being brittle. Ordinary glass is simply heated to redness, and on cooling it is annealed in oil, this process having the effect of greatly increasing the toughness of the material. The process is by no means an experiment, we are further informed, but "certain and unquestionable" in its results. If such is really the case—and there is no reason for doubting the matter—photographers have great cause for rejoicing, for a very large percentage of their productions are lost by the glass of their negatives giving way under pressure in the printing-frames, the trial through which clichés pass in pigment and collotype printing being often very severe. We shall have much pleasure in giving our readers further news of this matter as soon as more detailed information reaches us.

Improvements in Photographic Book Illustration.—We are glad to notice that Messrs. Ward, Lock, and Tyler, the well known publishers, have taken up the matter of photographic illustration. A volume they have issued, under the curious title of "Treasure Spots," contains upwards of a score of cabinet-sized photographs, printed by the Woodbury process. The best part about the volume is the way in which the photographs are displayed and mounted. A print simply pasted upon a sheet of letterpress, or surrounded by a margin of black printer's ink, of a different tint altogether to the photograph itself, is a most unsatisfactory illustration in a book, as has been proved over and over again. In the specimen of photographic book illustration in question, special attention seems to have been given to this matter, and the tint of the photograph is in perfect harmony with the printed margin that surrounds it. In this way a very effective publication has been produced, and one, too, which will pave the way, we think, to others of the same kind.

**THE PRACTICAL PRINTER IN AMERICA.
XVII.**

In the following chapter on printing with weak negatives Mr. Hearn enumerates a number of dodges which his experience as a practical printer has proved good. He has, however, omitted to refer to a point of primary importance. One of the most important aids to brilliant contrast with weak negatives is the use of a lightly salted and highly albumenized paper. A *Rives* paper coated with undiluted albumen, containing not more than four or five grains of chloride of ammonium to each ounce, will be found very valuable with thin flat negatives. This should be excited on a neutral or slightly alkaline forty-grain bath, or, if the bath be not neutral or alkaline, the paper should be fumed. Weak negatives gain greatly by printing in the shade. We now let Mr. Hearn speak.

"As is the case in 'printing intense negatives,' so paper should also be prepared especially for 'printing weak negatives.' White paper should be silvered for a specified time on a strong silver printing-bath (say from forty to one hundred and eighty seconds, on a bath from 45 to 80 grains strong of nitrate of silver to the ounce of water); but the strength of the bath and time of floating should vary according to the temperature of the weather, class of negatives to be printed, &c.

"When the paper is ready for fuming, it should be fumed not less than fifteen minutes, and often for half an hour. Sensitive albumen paper, when it has been sensitized

the day before, is excellent for printing very weak negatives, giving much bolder prints than it would if it were freshly sensitized. The paper for weak negatives, like that for intense negatives, should be kept by itself, and for this purpose have a box or drawer labelled 'Paper for Weak Negatives.'

"There are only a few negatives out of a day's printing that need any preparatory treatment before printing.

"In by far the majority of cases the beauty of the negatives consists in their thinness, unless they are so thin as to give very flat prints. In a thin or weak negative, such as one as I at present have in my mind's eye, its beauty consists in detail throughout in the strongest high-lights, as well as in the shadows; also in its colour, lighting, &c. In exposing there has been plenty of time given to the negative, and consequently detail is found in all of the shadows and draperies, with the exception of three or four places in the deepest shadows, where there is no detail, and which accounts for the brilliancy of the negatives. A cool grey colour to the deposit adds greatly to the beauty of the negative, as well as to its printing qualities.

"A nicely lighted negative, besides being beautiful—as we judge it by looking through—also prints better, because then there are left, by the artistic taste of the operator, a few judicious shadows, as last described, such as places in the hair, which by contrast are generally close to that part which has been powdered, and is photographically full of detail; and when we admire beautiful negatives, one of the first parts we look at is the hair, especially if it is a lady's, and we very often involuntarily exclaim, 'How brilliant and full of detail the hair is!'

"Now prints from these negatives, which are so brilliant, bold, and full of detail to the eye, very often astonish us, on account of their being exactly opposite to what we had been led to expect when we looked through them, and at first the photographic printer is bothered a little to account for it. This is accounted for as follows: they printed too fast, and the negatives may not, perhaps, have the photographic colour which produces the best print. To print slower, and to give the photographic colour they require, coating the back of the negative with yellow varnish has been advised, and I have tried it with considerable success; but the prints have a look of forced boldness and coarseness which spoils them in the eyes of most printers. Undoubtedly the yellow colour of the varnish is not what we wish. Nothing is better to give a good printing quality to the negatives than *white tissue-paper*.

"The way to overcome this rapid printing is to print either in deep shade, or under several tissue-papers (we have used as many as eight or ten),—the latter when you wish to place the board in the sunlight; and, besides printing slower, they will also print better. When a negative is very thin, we generally print it under a porcelain-glass, in the sunlight, and the prints are thus very much improved. Try it. Printing under several pieces of the greenest of window-glass is a very good thing, as a trial of it will show. Coating the back of too weak negatives with some old sensitive negative collodion will also improve the quality of the prints.

"A way which I very often try, if the negative is not too thin, is to coat the back of it with ground-glass varnish, and which I can vouch for as a good thing. The ground side of a ground-glass laid close to the negative is also excellent.

"But a negative which has flatness throughout, without any boldness worth mentioning, cannot be doctored by any such simple treatment as the above. More decided measures will have to be resorted to.

"One way to improve flat negatives is by the use of the blue-paint dodge, which has been so repeatedly described. I have very often laid it all over the face of the negative, but on the unvarnished side of it, and after removing what may be over the eyes, then have printed

it, after having covered the back of the negative—or, better still, the printing-frame—with tissue-paper.

"Then a very good way to allow the shadows to print up under tissue-paper, while the face is protected, so as to make them print bold (which they will do if printed under a piece or two of tissue-paper), is to cover the whole negative-board with tissue-paper, and then lay a dark cloth on that part which you wish to be shaded, moving it every few minutes while there. By a little ingenuity in the way of arranging tissue-papers they can be made to answer a variety of purposes."

The method of producing a duplicate image of the negative at the back by means of the powder process will also be found very valuable, and should not be forgotten.

THE RELATION OF LIGHTING AND EXPOSURE TO TEXTURE.

BY G. CROUGHTON.*

MR. NEILSON, in a short but able article contributed to the PHOTOGRAPHIC NEWS ALMANAC for this year, has struck a key-note worth following up. The article in question is upon developers and texture. It is, as he says, a somewhat neglected subject, but it is one which should demand serious attention; for there are, in my opinion, two things which have lately come into universal use among photographers calculated to do great injury to photography artistically, and are certainly utterly destructive to texture. I allude to retouching upon the negative, and the use of reflecting screens, or, rather, I should say, the abuse of these, for both in their places are useful, and, properly used, may help us to secure natural texture where we could not get it without them.

It may be asked—What do you mean by "texture?" Texture upon a photograph means a very different thing to texture in oil painting or water-colour drawing. In oil or water colours the artist uses certain means for obtaining a natural texture (in flesh painting, we will say); he has to load up his colours, glaze, and scumble, and so get a texture upon his canvas, which, when looked into, is anything but the texture of the smooth skin of a beautiful young lady, yet when seen at the proper distance gives that texture with all its soft, glowing colours and gradations to the life. It requires no departure from nature to get natural texture in a photograph.

Photography has been admired by artists for its wonderful reproduction of the texture of different fabrics, and has been used by them as guides on account of its accuracy. It has failed somewhat in flesh, owing to the fact of yellow being reproduced as a dark instead of a light colour, all flesh, however fair, being made up of yellow to a much greater extent than an inexperienced person would think.

To mend this inaccuracy retouching was called in, and if it had been confined to this, and gone no farther, it would have been a gain instead of a reproach; but with some persons it seemed that once the pencil was in their fingers they did not know where to stop, and the result, in nine cases out of ten, is the destruction of all natural texture, and the substitution of a mechanical stipple all over the face, representing to the eye nothing so much as a plaster cast or a face cut out of stone. How many times have I heard the public praise these things in terms which should be their greatest condemnation? "How beautiful it is—just like a statue!" Not "How like life!" simply because they were not like life. In these over-worked abominations we have an incongruity most offensive to an artistic or educated eye—a marble head with drapery the fabric of which is reproduced with the greatest fidelity.

The remedy in this case is easy: do not tamper with the natural texture in the negative; mend all defects, matching (as well as human eyes and hands can do) the texture, and

* Read before the South London Photographic Society.

do not attempt to substitute another, for all such attempts must end in failure. There is nothing so beautiful as the texture of flesh in a good negative, and it is worse than folly to do away with it and substitute a stippled mechanical one, which must end in smooth hardness, making the flesh look like polished stone.

Before proceeding to show how the use of reflecting screens tends to the destruction of texture in flesh, I would wish to say a few words as to the best means of securing a natural texture in the photograph. Mr. Neilson, if I understand his article aright, says it is to be secured by using a strong developer after a weak one; in my experience it is entirely a matter of lighting and exposure. Given the right lighting and exposure, I will guarantee to obtain texture with any developer. Try a sitter in the ordinary ridge-roof gallery, blocking out all side-light. Look at the face; the more front the light, the less marked the features and texture of the skin. Now close all front light and use only side light, and see how all is reversed. The texture of the skin is exaggerated, and every pimple looks at least twice the size it is. Every photographer who is in the habit of taking the side-lighted photographs, or the so-called Rembrandts, will at once recognise the accuracy of this description. With the light from behind the sitter, the accidental marks and texture are generally much exaggerated; and if the intensity of the light be not modified in some way, it will give no end of work to the retoucher. It is for this kind of portrait that the use of reflecting screens has been mostly recommended; and, if judiciously used, they are of great value in softening the heavy shadows, and getting rid of the exaggerated texture caused by the extreme side light.

Over-reflection will give exactly the same effect as over-touching—the destruction of the natural texture—in the same way as the front lighting. In my own practice I never use a reflecting screen at all; if a judicious combination of side and front lights be used there is no need of them; and for the Rembrandts I close up all light at the camera end of the gallery, bringing the sitter half-way up, leaving the side light behind all open, and softening the shadow with a high side light, or combination of top and side, in advance of the sitter, as the face may require, and with this lighting can always secure texture if the right exposure be given.

In my experience the exposure has as much to do with securing natural texture as the lighting. An under-exposed negative which has to be forced in developing will be coarse in texture, while over-exposure will be utterly destructive to all texture.

Mr. H. P. Robinson's lesson in the same YEAR-BOOK upon softness, taken with Mr. Neilson's upon texture, is a salutary dose which photographers will do well to take; for there is just as much want of texture in the over-softness condemned by Mr. Robinson as in the hardness condemned by Mr. Neilson. But, while agreeing with Mr. Neilson so far, I must say, with all due deference to him as an artist and a photographer, that I cannot agree with him in seeking texture in developers. Texture is upon the model, and can be secured by any developer, provided the lighting and exposure have been properly adjusted.

STEREOSCOPIC TRANSPARENCIES.

BY F. HOWARD.*

In calling the attention of the members to this phase of photography it must be understood that I approach the subject particularly from the recreative aspect, and I am afraid that in venturing on this subject I am calling attention to what has not been a popular feature of photography, or rather, I should say, to what has been a neglected one.

For several reasons the stereoscope has been very much forsaken—partly because of the hundreds of bad and

inferior instruments and slides with which we were flooded, and partly also from another cause, viz., the bad taste displayed in many of the subjects chosen. Bad instruments fatigue the eye, and bad subjects give the whole thing a bad name. Good glass transparencies are, on the other hand, if viewed in a good instrument, always a source of pleasure; and it is from this circumstance, and the fact that they afford such favourable ground for the amateur, that I have for some time past endeavoured to obtain the requisite knowledge and materials to amuse myself with their production.

The increased area of work which stereo. pictures offer, viz., marine and instantaneous effects, also makes the subject more attractive; but since Mr. Breeze's picture very little has been done, and it is still almost untrod len ground. I entirely confine myself to the production of transparencies by printing in the camera. My reasons for so doing are:—Firstly, because printing by superposition necessitates cutting the negative, and it is also necessary that the negative should be exactly the size you wish your transparency to be, and this is not always convenient. Printing by contact is very likely to damage the negative, and the preparation of plates is attended with a much greater consumption of time; and when the amusement is only to be indulged in at spare hours, and those are not many, camera printing becomes more easy.

I will now state the method I have followed in producing the slides which I now show you: it is also necessary that I inform you that all the slides I exhibit this evening are printed in the camera. The size I have adopted for the negative is 7 × 4 inches; this, whilst allowing ample margin, is not too large. The width between the lenses is three and a-quarter inches.

The camera I would recommend is a rigid one, or at least one without a bellows body, because of the tendency to harbour dust. The negative for printing a stereo. transparency from should be as perfect as possible, and dust is of all things the most troublesome. Minute defects which would not be observed in a paper print will on glass show most annoyingly.

There is a legend that the operator who prepares plates for exposure and printing by the albumen process is compelled to denude himself of his clothing, grease his hair, and hold his breath to avoid dust; but for the truth of this I cannot vouch. I can certainly say that dust is the worst evil one has to contend with; everything must be filtered carefully, and the camera, slide, and plate-box carefully sponged out, the varnish certainly filtered, and the greatest care exercised throughout to protect the negatives.

The class of negative is best described as being soft, harmonious, not too vigorous, and absolutely free from fog, a properly-exposed negative, developed with iron and without intensification, answering well; for additional vigour can be obtained in the printing, whereas absence of detail and too much vigour is fatal to good results.

The camera for printing must not be simply a copying camera or mere box, such as will serve for enlarging or copying purposes, but should be a carefully-constructed instrument with rack-work movement at each end, a means of laterally and horizontally moving the lenses, the focusing-glass and carrier most exactly fitting, and the negative lenses, and sensitive plate perfectly parallel.

The negative to be copied must now be placed (varnished side outwards) in its groove, the lenses carefully adjusted, and an image focussed. And now will be seen the great advantage of copying in the camera over printing by superposition. You can enlarge, diminish, cut off the foreground, and take the best of the negative, mask portions, or print in a sky and clouds.

The sensitive plate exposed, the colour desired can now be given; and here we get upon very debatable ground. The colour of the positive is by many liked of a brown sepia, others prefer a vigorous black, and between these is a gradation of purples; but whatever colour you desire of a vigorous character your negative must be sufficiently

* Read before the South London Photographic Society.

vigorous to allow of the printing being carried far enough, the same as in paper prints, and your negative shadows perfectly clean and free from fog. The various colours are much influenced by the exposure and the method of development. Iron developer with varying exposure will give brown tones; pyrogallol development with varying exposure, black and purple tones. Toning with gold and platinum will give black and blue-black; bichloride of mercury and ammonia will assist in giving sepia tones from a vigorous negative.

Now as to the best kind of glass. Remembering that you have to mount two pieces together, the thinnest glass you can obtain is that most desirable. Unfortunately the thinnest glass is often very imperfect in quality; but a little increase in price will allow of its being selected, and that which is somewhat imperfect can be utilised for mounting as imitation ground glass. This glass is of French manufacture, and is, I think, only to be obtained at one house in London. The thin ground glass can also be obtained, I believe. I have found it a good plan to make a varnish of three grains of white wax dissolved in an ounce of ether or chloroform; this added to an amber varnish gives a very good imitation of ground glass, and is a very satisfactory method.

In printing-in clouds much the same method is adopted as with paper prints, viz., masks are used to protect the sensitive surface, and the printing is done in a diffused light. A little patience must be exercised when trying for the first time; but, like other difficulties, it is soon surmounted. A lithographic card is a great finish to the mounted slide, and also a great protection. I do not think these are to be purchased. I make my own; that is to say, I lithograph the design and have it printed, also the binding paper with a border.

SUGGESTIONS ON RETOUCHING.

In the course of an article on retouching in the *Western Photographic News*, the following suggestions are given:—

"1st. Practise with the pencil until perfect precision and delicacy of touch are attained.

"2nd. Use the 'hatch line' more than the 'stipple dot' wherever it is possible.

"3rd. Turn the negative partially upon its side while working the upper portion of the face, to enable the work to preserve the same direction as the natural lines of the face.

"4th. Work most upon the forehead, the least about the mouth, eyes, and chin.

"5th. The darkest parts of shadows are near the edge, the centre being illuminated by reflected light.

"6th. If it becomes necessary to lighten up a shadow, do so by working most upon its reflected light.

"7th. To give relief, brilliancy, and effect, work just as little upon the shadows as possible.

"We will suppose the retoucher to have before him a

PERFECT NEGATIVE;

that is, one that has bright and strong high lights, delicate and yet sufficient shadows, possessing texture and fine gradation of light and shade throughout the whole, and expression of face all that could be desired. Now, I would say to him, 'By all means leave those shadows alone.' Work out the spots and objectionable points in the light until they become round, smooth, and nicely blended with surrounding parts, and then leave it. Endeavour not to make a stroke more with the pencil than is necessary. And the more delicate and sure each stroke the finer the result. Again, we will suppose that we have before us a

VERY INTENSE NEGATIVE,

one that has large thick patches of light, without suitable gradation into the shadows, with shadows unilluminated and too dark. The most that can be done in this case is to make the brightest lights much brighter at their very highest points of light. For the shadows, if too dark, work as much as possible in the illuminated portion, and

just as little between these two extremes as the negative will admit. Now we have a

THIN FLAT NEGATIVE,

one that would make a better solar than contact print, neither bright light nor deep shadow, a tameness that would invariably produce a muddy, expressionless print. Now, as we cannot make the shadows darker only by contrast, it follows that the brighter we make the lights the darker the shadows will appear. The quickest method I have ever found to do this, is to draw an unlimited number of fine lines over the thickest portions of forehead, cheek, nose and chin—lines so fine as not to be discernible to the eye, only in effect; and when the negative is sufficiently dense by this method, then fill the interstices as carefully and abundantly as though first commencing work, smoothing the whole face, with the thought of giving a more perfect idea of the natural form of each feature. The smaller space this lining and interlining takes up, and yet be nicely graduated into the half-lights, the better."

CHROMO-PHOTOGRAPHY OR PHOTO-MINIATURE.

BY A. LIEBERT.*

Preparation of Paper.—Unalbumenized Steinbach paper is floated upon a gelatine bath for a period of three or four minutes, the glazed surface downwards. The bath is thus made up:—

Filtered water	1 litre
Chloride of ammonium	10 grammes
White gelatine	3 "
Citric acid	10 "
Bicarbonate of soda	13 "

The drying of the paper should take place in a warm room.

The most beautiful and richest tones are secured with an ammoniacal silver bath; this possesses, moreover, the advantage that it allows of less intense negatives being employed; the depth of tone is considerable, and the lights are white and brilliant.

The ammoniacal silver bath is thus prepared. In one bottle there is placed a solution made of:—

Nitrate of silver	150 grammes
Water	1 litre

The half of this solution is put into a bottle; to the other half is added in small quantities so much concentrated liquid ammonia that the precipitate formed at first is again perfectly dissolved, a circumstance that is brought about by continually shaking the liquid. As soon as the latter begins to get clear again, the ammonia should be added very slowly and in very small quantities, so that no excess thereof comes into the solution. Half of it is taken, and so much pure nitric acid added that blue litmus paper dipped therein changes to a fresh red colour. All the solutions are then poured together, and the mixture filtered.

As soon as the bath blackens after being some time in use, it may be cleared by adding a few drops of nitric acid and filtered. The bath must not be exposed to daylight, as it is particularly sensitive, and no more should be prepared at a time than is absolutely necessary. The paper, as before stated, should be permitted to float upon the solution for three minutes.

Prints produced by means of this bath do not become much lighter in the after processes, and for this reason must not be much over-printed in the frames, as is the case with albumen pictures. The silver bath must always be in a good filtered condition, and kept in a well stoppered bottle, otherwise a film of metallic silver is formed which is the cause of spots in the prints. The toning and fixing of the prints are carried on in the same way as usual.

In producing photo-miniatures two prints are necessary from the same negative. The best format for these pictures is 21 by 27 centimetres or 24 by 30 centimetres. As it is inconvenient to retouch to any extent, it is well to employ good, sharp negatives, if possible with a dark

* *Photographisches Archiv.*

ground. Both of the prints must be a few centimetres larger than the finished picture is required.

We will suppose that we have to print from a negative 24 by 30 centimetres. One of the prints is put in a damp condition upon a glass plate measuring 21 by 27, the edges are folded underneath, and gummed down with thick gum, so that the picture when dry lies perfectly flat.

In four little porcelain dishes, four pigments are mixed, as under :—

- | | |
|-----------------------------|---------|
| 1. Naples yellow, about ... | 4 parts |
| Red madder varnish ... | 1 part |
| 2. Red ochre ... | 4 parts |
| Carminc varnish ... | 1 part |
| 3. Carmine varnish ... | 6 parts |
| Red ochre ... | 1 part |
| 4. Sepia ... | 4 parts |
| Red madder varnish ... | 1 part |

With a somewhat thick camel's hair pencil, all the flesh parts of the portrait are covered with No. 1 mixture. All the applications must be made quickly, and in a sweeping manner, without any pause or hitch, so that on looking through the print no outlines of dry colour are visible. When the first film of colour has dried, there is applied, one after another, three coatings of No. 2 mixture. The shadows under the eyes, the nostrils, ears, and chin are strengthened by a coating of No. 4 mixture, and then the whole is allowed to dry.

For blue eyes, cobalt blue may be employed; for grey, indigo; for brown, burnt terra sienna, with a little umber or sepia. But all these colours must be applied in a very dilute form. The point of light in the eyes must be delicately put in by means of Chinese white. Blonde hair is painted with yellow ochre or burnt sienna, brown with umber, which may be made darker and blacker by the addition of sepia, &c.

The drapery is covered with smooth tints. Such stuffs as are not rendered well by photography, and are represented dark in the print—such as red, yellow, green, &c.—must be blocked out in the negative, so that they can afterwards be tinted the right colour. White lace is put in with the aid of white pigment. Gold ornaments are put in with Indian yellow or gamboge.

The background is covered with an even tint, according to taste. Burnt umber, mixed with sepia or Vandyke brown, mixed with with some *vert de vessie*, may be employed for the purpose with advantage. The colours must be used in a dilute form, and be applied two or three times over, in order to secure body.

When the first picture has been painted and finished, it is rendered transparent, and attached to a glass plate. To do this, the following mixture is requisite :—

- | | |
|-------------------|-------------|
| Canada balsam ... | 100 grammes |
| Spermaceti ... | 75 " |
| White wax ... | 25 " |

This wax is heated in a water bath, and, on becoming cold, forms a stiff paste. To cement the picture, a small piece of apparatus is necessary such as shown in the cut here given. It consists of a little iron table, F, G, H, I, of about thirty by forty centimetres, which stands upon four iron feet fifteen centimetres in height. Under the table are put four spirit lamps, D, E, with an arrangement for raising and lowering the wicks, so that the flames may be increased or decreased as may be necessary. A and A are scrapers having their lower margins fitted with very soft chamois leather. The dish C contains the above-mentioned mixture, and a spatula H. In the drawer are contained other things necessary for the process, such as brushes, colours, and the like.

The coloured picture attached to the glass is separated by means of the blade of a knife; the margin is cut through all round, leaving two or three millimetres adherent to the plate.

Upon the iron plate B is put a sheet of blue paper, and upon this a well-cleaned sheet of patent plate glass. As

soon as the glass plate has become pretty warm, it is brushed over with the wax mixture, the same being equalized by means of the spatula. As soon as the mixture has become fluid the picture is placed face downwards evenly upon it, and the air-bubbles are then pressed out by the



aid of the two scrapers before mentioned. After the lapse of ten or fifteen seconds, the picture becomes perfectly transparent. The spirit lamps are then removed, the picture is lifted up, and a further supply of wax is put upon the plate; the picture is again pressed down upon it, and rubbed well in order to prevent too much of the mixture becoming absorbed, and to avoid the formation of air-bubbles. When the plate has become cold, it is taken from the table and its surface is cleaned first with turpentine and then with alcohol.

The picture now appears flat and without vigour. To give it the necessary vigour and brilliancy, a second print must be laid under it. This is prepared as follows :—

The glass plate upon which the first picture has been coloured is covered with a thin film of gum-solution, and the second print is now placed face upwards upon it, and rubbed in all directions, so that it adheres well in every part. After drying, the print is coloured quite superficially. The outline of the hair and the shadows of the face are tinted light blue, the darker ones being strengthened with sepia. Cheeks and lips are treated with a mixture of zinnabar and carmine, and over the whole of the flesh is laid a thin layer of Chinese white, in order to blend the colours together. Blonde hair which has come out too dark is covered, in order to lighten it, with a mixture of white and chrome yellow. Certain portions of the garments are strengthened, especially in the shadows, with colour that has been mixed with gum-water. The background is treated with pastel with the finger in such a way that the tone around the head is light, and increases in depth towards the margins of the prints.

On the margins of the picture are cemented strips of cardboard from one to two millimetres in thickness, and the first print, which has been rendered transparent, is placed upon it so that all portions accurately coincide.

The slight space existing between the two prints gives the finished picture a beautifully harmonious character. It is possible, if considered desirable, to mount the lower picture upon stout cardboard instead of upon glass, and upon this, in a dozen places in the deep shadows, to put tiny bits of cardboard to act as a support to the top print; but these supports must not, of course, be visible.

When everything has been thus carefully carried out, the margins of the double picture are skilfully covered with paper, so that their relative positions shall not change, and no dust penetrate between. It is the best plan to mount such double pictures in a velvet frame, or passepartout.

The Photographic News.

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DISEASES OF PHOTOGRAPHERS.

A CORRESPONDENT on another page suggests that a series of articles on the diseases to which photographers are peculiarly incident would be instructive and interesting, and he points his suggestion by mentioning the names of several gentlemen, who have been well known in connection with the art, who are alleged to have been the victims of one painful and not very common malady. We may say at the outset that we do not think that there are any diseases to which photographers are, as photographers, especially liable, or to which the practice of their art renders them peculiarly subject. The mental strain, at times unhealthy atmosphere, irregularity of hours of refreshment, and other causes detrimental to vigorous health, to which photographers often submit themselves, they suffer in common with many engaged in other avocations; but these influences, whilst undoubtedly injurious to health, are not entirely inseparable from the practice of photography.

In regard to the cases cited, we can set our correspondent's mind somewhat at rest. There is an error in his information. Mr. Rejlander never suffered from Bright's Disease; his death resulted from a not less painful, and probably equally fatal malady, *diabetes*, which, although essentially different, is, like Bright's Disease, or *albumenuria*, a disease of the kidneys. It is not desirable in these pages to enter into the technicalities of disease; but we may briefly state that in the latter disease these organs, instead of secreting albumen and eliminating urea, perform exactly the opposite function, discharging the albumen and allowing urea to be absorbed into the system, eventually producing blood-poisoning. In *diabetes* there is a tendency to convert everything into sugar, which finds its discharge through the kidneys. The death of Mr. T. R. Williams was due to the latter malady. Certain circumstances connected with the illness of Mr. Lacy, to whom our correspondent makes reference, led us to consult with an eminent physician who had made Bright's disease a special study, in order to ascertain whether any of the influences to which photographers were subject should render them specially liable to this malady, and we received his assurance that he saw nothing whatever in the occupation or influences affecting the photographer which should in any way especially tend to the disease in question.

The photographer is, as we have on former occasions remarked, subject to the pressure upon his nervous system involved in the exercise of a profession causing at once some strain on his scientific, artistic, and social culture. The heat of the studio and the fumes of the dark room are at

times depressing; and, probably more injurious than all, the photographer often continues under these depressing conditions, forgetful or regardless of the necessity of regularity in taking refreshment, and so invites dyspepsia and its attendant train of evils. But all these are common to many pursuits, and may to a large extent, by resolutely judicious men, be avoided. To special diseases the photographer is in no unusual degree liable, and as the notion that he is so is in itself unwholesome and depressing, we recommend our correspondent, and any who may for a moment have shared his notions, to dismiss them as without the slightest foundation.

PHOTOGRAPHIC EXHIBITION IN BRUSSELS.

WE are informed that the Belgian Photographic Association will hold its first exhibition at Brussels in July next, under the patronage of the King. The collection of pictures will be exhibited at the *Cercle Artistique et Littéraire* (Literary and Arts Club), in Brussels, between the 15th July and 15th September next.

Any enquiries should be addressed to the Secretary, M. Rommelaere, Rue de Namur 44, Brussels; but we very briefly state here the principal conditions of the exhibition. Application must be made for space by intending exhibitors not later than the 1st May, and a charge will be made at the rate of five francs per square metre, half the amount due being paid on the 15th May at latest. The exhibits must be sent in not later than the 1st July, carriage paid, with the proper advice, the name of each subject and how it was produced being included in the information given.

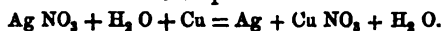
A hanging committee will decide as to the fitness or otherwise of the pictures for exhibition, and foreign exhibitors will compete for medals in the following branches of the art, viz., heliographic engraving, heliotype, Woodburytype and similar processes, photolithography carbon photography, silver printing, and photography upon glass or porcelain. Moreover a *medaille d'excellence* will be offered to the exhibitor whose works show most merit.

The jury for making the awards will be composed of eleven members, of which five will be foreigners. There will be no sale of the photographs exhibited, but a lottery will take place at the close of the exhibition, the works chosen being paid for by the Association. All pictures must be withdrawn at the cost of the exhibitor a week after the close of the exhibition.

ON THE PRECIPITATION OF SILVER FROM ITS SOLUTIONS BY COPPER.

BY WILLIAM HENRY WATSON.

THE method of precipitating silver from solutions of its salts by copper or zinc is unquestionably one of great utility to the photographer, and a great improvement on the processes which used to be adopted.



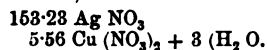
This action is rapid, for immediately the copper touches the silver solution the decomposition takes place. The precipitate formed is repeatedly washed with water, and finally dissolved in moderately dilute nitric acid to ensure it as silver nitrate. It has been observed, however—and upon the subject I have conducted several experiments—that along with the metallic silver there is generally precipitated more or less cupric oxide, so that the silver obtained by this process is not in an absolutely pure state, but contaminated with copper; and on dissolving in diluted nitric acid the result is a mixture of silver nitrate and cupric nitrate, thus unfit for many experiments in which silver nitrate is required. The results of my experiments alluded to above have been as follows:—

A solution of silver nitrate, containing 0.5 of Ag NO₃,

100 of water, was prepared and used during the experiments below, a sheet of copper being used as the precipitant. The precipitate was washed till there was not a trace of Cu NO_3 present, dried, and examined.

				Cupric oxide found in 100 parts of precipitate.
Experiment 1	...	...	...	2.70
"	2	...	...	2.66
"	3	...	...	2.71
"	4	...	...	2.59
"	5	...	...	2.68
"	6	...	...	2.63
"	7	...	...	2.70
Mean				2.66

Hence 100 parts of the precipitate would furnish, on treatment with nitric acid,



158.79 total.

It has been suggested that the precipitation of the cupric oxide along with the metallic silver is due to the action of atmospheric air in absorption, and experiments have generally agreed with this view. If, again, the copper be exposed to the air during the process, the amount of cupric oxide precipitated is increased. Thus it will be seen that we do not arrive at pure silver by precipitating and carefully washing the precipitate in water, but that it is requisite to wash it with dilute hydrochloric acid, in which the cupric oxide is readily soluble, while the metallic silver is not soluble. Adopting the view that the precipitation of cupric oxide is mainly due to atmospheric oxygen, it seems probable that by boiling the solution of silver salt, and thus expelling from it much of the gases in absorption, prior to commencing the process of precipitation, the cupric oxide formed would be considerably diminished.

I may add that these remarks apply to precipitation by zinc as well as by copper.

EXPERIMENTS WITH IRON DEVELOPERS.

BY MM. ROTTIER AND WALDACK.*

SOME experiments have been undertaken by us with the view of discovering what are the most suitable bodies to be introduced in the composition of developers made with iron salts, and to find out the proportions in which these should be mixed in order to produce the best results.

In the experiments made, all of which have been conducted by means of the ordinary wet process, we have worked by comparison. Two clichés produced under identical conditions were developed by different developers, the one of these solutions being a standard, the other, one whose qualities it was desired to find out.

In order to obtain two latent images as exactly alike as possible, we made use of a binocular camera, and obtained upon a plate measuring nineteen centimetres by eleven centimetres the double image of some objects grouped before an apparatus, in the same way precisely as when a stereoscopic negative is taken.

To develop the two latent images obtained, there was placed, first of all, across the middle of the cliché, as soon as it came out of the camera, a strip of glass, which divided the two halves, and allowed the developer to be poured upon one portion without developing the other, which was treated as soon as the first picture had been finished. This plan was attended with some inconveniences, and for this reason was not always made use of. Every time that it was necessary to work with accuracy and precision, the following method was substituted, the results of which were far more trustworthy.

The plate which it was proposed to employ was in the

first instance scratched with a diamond across in that place where, later, its division was contemplated, to separate the two images. The plate was then in a condition to be easily broken on coming out of the camera, so that it was possible to develop the two images separately.

Finally, to take the experiments in a certain order, we examined, successively, the influence upon the period of exposure, and upon the nature of the images produced by,—

1. The quantity of sulphate of iron.
2. The acids introduced into the developer.
3. The nature of the iron salt employed.

The influence of the quantity of sulphate of iron.—We have found, after many other investigators, that the quantity of sulphate of iron contained in the developer exercises a very great influence upon the nature of the negative produced. Whilst a developer containing but a small quantity of sulphate only gives rise to a faint image of a violet transparent character, those of a more concentrated nature produce negatives of considerable vigour and opacity. With a dilute liquid the image develops slowly, whilst with a strong solution the plate is instantly developed. A weak solution penetrates into the collodion, and produces a deposit of silver throughout the whole thickness of the sensitive film, while a concentrated developer which acts briskly, only gives rise to an image upon the surface of the cliché.

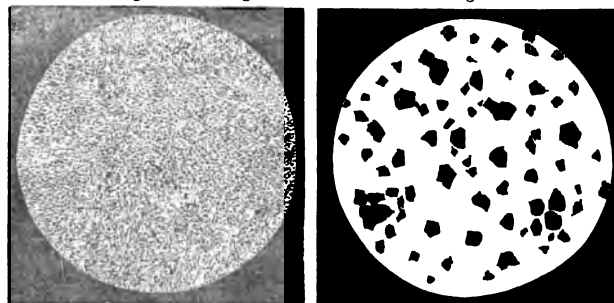
Between certain degrees of concentration the negatives grow in intensity according as the amount of sulphate of iron increases. This difference in intensity, very apparent in developers which contain only moderate quantities of sulphate of iron, appears to be less marked when the concentration of the liquid increases, and when developers are employed containing exaggerated quantities of sulphate; indeed, inverse results even are thus produced. In this case images developed by strong solutions are less vigorous than those obtained by dilute liquids.

Clichés secured by the aid of developers more or less concentrated differ not only as regards the intensity of the images obtained, but also in the physical nature of the particles of silver deposited.

When the proportion of iron contained in the developer does not exceed certain limits, the metallic particles, which together constitute the cliché, appear in general to be large in the proportion as the developer employed upon them is more concentrated, and there seems to exist up to a certain point a relation between the size of these particles and the degree of concentration possessed by the developer. The cuts here given convey some idea of the

Fig. 1. Enlarged 800 diameters.

Fig. 2.



Hundredths of a millimetre.

aspect of the particles viewed under a microscope capable of enlarging 800 diameters. Fig. 1 is a cliché obtained by means of a developer containing half per cent. of sulphate of iron. Fig. 2 is a cliché secured by the aid of a developer containing eight per cent. of sulphate of iron. The mean dimensions of the particles of silver in fig. 2

* Bulletin de l'Association Belge.

MY DEAR SIR,—Mr. H. Baden Pritchard, in last week's *News*, very properly corrects, or rather carries one stage farther, the comparison between the exhibitions of 1873 and 1874. May I, as one of the Exhibition Committee last year, when a reduced amount was received, and a loss of £40 incurred, be allowed to draw attention to circumstances which occasioned it? 1873 was a year when, with the advent of the handsome sums offered by Mr. Crawshaw, great enthusiasm was aroused; numbers of pictures were especially taken for the Exhibition, and a very much larger number of visitors than usual thronged the Society's rooms. But wide differences of opinion were expressed at the decision of the judges in many important cases. Last year (1874) was the year of revolution in the Society. When, under the plebiscitary ballot, a council was constituted, a proposal was made to substitute the Crawshaw Competition for an Exhibition, but the motion was negatived. From that moment, however, began ominous rumours about having no Exhibition worth looking at, which seemed to gradually acquire consistence, without any tangible or definite statement being made. The rumour reached all parts of England, and was sufficiently likely to cause hesitation in preparing pictures until too late.—I am, respectfully, SAMUEL FRY.

THE BALLOT AT THE PHOTOGRAPHIC SOCIETY.

SIR,—The report of what Mr. Spiller said at the Photographic Society's meeting renders it necessary for me to say a few words.

When it was seen that I was proposed for President, a number of my friends wrote to me asking what I wished done, and, in many cases, enclosed me their ballot papers to fill in.

In all these cases I (as a point of honour) struck out my own name even as Vice-President. In this way I know that I deprived myself of such a number of votes as would have obtained for me the latter position.

This was the necessary sequence of Mr. Spiller having proposed me without my knowledge, and I regret having been proposed in opposition to Mr. Glaisher, for whom I have strong personal liking and esteem.—Yours, &c.,
H. STUART WORTLEY.

THE PHOTOGRAPHIC SOCIETY.

SIR,—I see that Mr. Werge alludes to a circular sent out to a number of the members who had not paid their subscriptions as "offensive," at the late meeting of the Society. I received one of these circulars (not having paid my subscription), and I at once complied with its request, and paid my subscription for this year. So far from thinking the circular "offensive," I think it very right and proper that all *bona fide* members should pay up their subscriptions for the year, before they are allowed to exercise any rights of membership.

This is an inflexible rule in all clubs and societies of gentlemen, and is most strictly enforced. How long would Mr. Werge and his brother dissenters like to exercise their privileges of membership without paying their fees? Is it one, two, or more years? I heard rumours last year, when the Society was nearly broken up, that there were some members voting and speaking at meetings who had not paid up their subscriptions for several years. It is to be hoped this is not the case. If it is to be the rule in future, I believe the Society will not last much longer. Already some of my brother photographers (old members of the Society) are talking of leaving it. And to me the chief advantage of the Society seems to rest with those "professional" photographers who do not even condescend to pay their annual guinea to its funds, but take care to advertise their establishments by getting the best places on the walls for their pictures at the annual exhibition.—I am, sir, faithfully yours,

FRANCIS W. TURTON, Commander, R.N.
Bedford, February 16th.

DEVELOPMENT BY VAPOUR.

DEAR SIR,—The time is come when amateurs would do more in photographic work, but they must be enabled to do so without soiling a white kid glove. And why not? What is wanted is the developing and fixing by vapour, such as was obtained by the old mercury and iodizing boxes used in the Daguerreotype process; and as alkaline or acid vapours can be produced easily, some photographic chemist should fix his attention to what vapours shall produce the picture on the sensitive plate, and so fixed that all the future operations,—printing, enlarging, &c.—could be done by the professional.—Yours truly,
J. SOLOMON.

[There is undoubtedly room for experiment in this direction. It is probable that a bromide plate may be developed by the fumes of ammonia, and we have ourselves successfully intensified a negative by submitting it successively to the fumes of mercury and iodide.—Ed.]

DISEASES OF PHOTOGRAPHERS.

SIR,—I see it mentioned in your contemporary that the death of the late Mr. O. G. Rejlander was due to a painful malady known as "Bright's Disease," and the name of another photographer is also mentioned who recently died from the same uncommon ailment. This recalls to my mind the fact that Mr. Lacy, a photographer of considerable mark in the Isle of Wight, also died of "Bright's Disease," and I have heard it rumoured that the death of the late Mr. T. R. Williams was from something of a similar nature. As these are cases of which we hear, it is not unnatural to speculate on those which do not come under public attention, and to ask if there is anything in the practice of photography which brings about or predisposes the victim to this fatal illness? Amongst the many good services your journal has done the lovers of our art, I think the issue of a series of articles on the diseases to which photographers are especially liable would not be the least.—I am, sir, yours gratefully,
L. L. F.

MECHANICS FOR PHOTOGRAPHERS.

DEAR SIR,—In my large acquaintance amongst my photographic brethren in the provinces, I know of none to whom some knowledge of mechanics and the use of tools would not only be desirable, but, in many cases, is absolutely necessary. The making of frames and stretchers for pictures properly belongs to the art of carpentering, but, being a very light branch, can be easily carried on, and oftentimes with better success, by an amateur. Accidents will frequently happen to apparatus. Experiments may be required to be undertaken which would necessitate the formation of some suitable appliances. In the *PHOTOGRAPHIC NEWS* are often put forward ingenious contrivances, easily made by those who know how, but otherwise almost useless. I have often heard it said: "Oh! any common carpenter can do it." This is a fallacy; the hands of a common carpenter, from the coarseness of his work, become hard and horny, and his touch insensitive. He is as unfit to mend or make a delicate piece of photographic apparatus as a blacksmith would be to do the same by a watch. Seeing this, I have often regretted that none of your correspondents have offered to give a few familiar instructions in what may be termed photographic mechanics. I will, with your leave, do my best to supply this requirement, first premising that I do not write for the clever ones who know everything, but for beginners; and with this caution, that I do not advise any one to undertake the making of articles that can be obtained in the trade properly manufactured. The use of a knowledge of mechanics to a photographer is, that he may be ready in contrivances when and where they may be required, no assistance being at hand.

A short time since, in the *News*, a very interesting paper was given upon glue and its uses; it being the article of all

periment mentioned, and, finally, I found I had 530 grains of nitro-glucose. The powdered and dried lump sugar used weighed one and a-half ounce, or 656 grains; the weight of nitro-glucose being 120 grains less. The loss in converting was equal to 18.3 per cent., leaving 81.7 per cent. as the percentage of nitro-glucose obtained.

This second batch, I believe, is very good. It dissolves readily in collodion, and also, but slowly, in methylated spirit. A few drops of this last solution put into water gives a fine white cloud, which is excessively slow at settling.

The next experiment I made was on the 7th January last. Three and a-half ounces of dried and powdered saltpetre were put into the jar. Upon this was poured four fluid ounces of sulphuric acid stirred well in, then the jar covered over with the glass plate, and surrounded with water in the large wash-hand basin as before. Temperature in the yard, 46° Fah. In about two hours another ounce of acid was added, as the mixture had become quite hard. Three and a-half ounces of dried sugar were then gradually stirred in. The sugar made the mixture stiffer at first, but heat began to be produced, which made it quite thin, and show a yellow colour. I could see that mischief was brewing, and in a few moments carbonisation began, accompanied by volumes of red nitrous acid gas, which drove me away, the result being a large quantity of black, spongy, wet carbon, as before. This was the third failure. In this experiment I had been again operating upon too much material for the size of the jar, and there was a great change of weather.

On the 28th January, for the sixth and last time of trying, I endeavoured to repeat the experiment made on the 23rd December, when I obtained 530 grains of nitro-glucose. The same quantities of materials were used, but the temperature out of doors had risen 24°, the thermometer being now at 52° Fah. instead of a keen frost. While the mixture of acid and saltpetre was cooking, rain fell, and I had to wait till it ceased. The mixture when cooled was only half solidified, and the sugar made it still thinner. I should have had the carbon process over again directly had I not at once brought up a force I had in ambush in the shape of a jug of cold water, to quiet the rising tendency, and produce tranquillity, &c. All was put to filter, and after washing and kneading in warm water next day, I found I had 471½ grains of nitro-glucose, being 184½ grains less than the original weight of sugar used. This gives 28.17 per cent. as the loss in converting, and leaves 71.83 per cent. of nitro-glucose obtained. This result is about ten per cent. worse than the other—attributable, I think, to the higher temperature and greater moisture of the weather. My appetite for making nitro-glucose is now satisfied. I set out to try whether saltpetre could be used instead of monohydrated nitric acid, and I have proved that it can; and that ordinary commercial sulphuric acid may be used in place of fuming sulphuric acid.

In the absence of a proper arrangement for carrying away the corrosive vapours it is not a pleasant process. You are liable to be "over-exposed" out of doors, and may get a chill which will affect your "tone;" then "over-fuming" is sure to happen, and you get "decidedly acid," so you must not begrudge a good washing. You had better not have your Sunday clothes on, or, when you think you are "well mounted" you may discover some "spots" which will be rather difficult to "stop out."

METEOROLOGICAL NOTES ON THE YEAR 1874

FROM THE REGISTER OF WILLIAM HY. WATSON.

The monthly mean, maximum, and minimum temperatures observed at Braystones, near Whitehaven, during the

year ending December 31st, 1874, have been as follows:—

1874.	Maximum.			Minimum.			Mean.		
	Mornings.	Noons.	Nights.	Mornings.	Noons.	Nights.	Mornings.	Noons.	Nights.
January...	47°	48°	47°	32°	36°	34°	41°	43.7°	40.7°
February...	44	50	48	28	34	28	37.3	41.5	38.4
March...	50	52	48	28	36	34	42.9	48.3	42.7
April...	68	71	64	38	48	39	49.3	55.1	48.7
May...	60	66	57	42	46	41	49.9	54.7	48.7
June...	68	72	60	42	56	47	58.9	63.3	55.4
July...	72	78.5	72	52	60	55.8	65.8	67.7	62.7
August...	64	69	64	52	54	52	58.9	62.0	58.6
September...	60	66	60	52	53	47	56.4	59.6	55.7
October...	56	60	56.5	46	50	50.8	54.1	49.9	49.9
November...	54	57	54	32	32	32	43.5	45.8	43.1
December...	46	47	45	18	28	23	32.1	36.9	32.6
In the whole year	72	78.5	72	18	28	23	48.1	52.6	48.1

The following table shows the number of fair days, the number of days on which more or less rain fell, the number of fair, clear, and sunny days, and the number of fair days gloomy:—

1874.	Fair Days.	Rainy Days.	Fair and Sunny.	Fair, but Gloomy.
January	9	22	8	6
February	15	18	9	6
March	15	16	8	7
April	14	16	13	1
May	16	15	11	5
June... ..	23	7	20	3
July... ..	16	15	12	4
August	14	17	8	6
September	10	20	4	6
October	11	20	4	7
November	13	17	3	10
December	20	11	11	9
Total	176	189	106	70

Thus, during the year 1874, there have been 13 more days on which rain fell than absolutely fair days; and of the total number of fair days, the clear and bright days preponderate by 36. On comparing the means of the observations, we find that the mean temperature of the mornings was exactly the same as that of the evenings. In April the temperature was unusually high for that month. The mean temperature of December was 2° below that of December 1870, which was the last frost we have had of any moment, and 5.2° below the mean of the same month in the previous four years.

Correspondence.

COST OF THE PHOTOGRAPHIC EXHIBITIONS.

DEAR SIR,—I think it would have been well if Mr. H. Baden Pritchard, before giving you his version of my remarks concerning the Exhibitions of 1873 and 1874 (made at the recent meeting of the Photographic Society), had taken the trouble to correct his own impressions by looking into the accounts published last year by himself. He will there find—

1st. That the total cost of the Exhibition 1873 was £112 13s. 7d., and not £128, as he tells you in his letter.

2nd. That the admission fees and sale of catalogues realized £83 odd; and that £30 was received for special advertisements inserted in the catalogue.

3rd. The total amount taken was therefore £113, and not £130, as stated by Mr. Pritchard.

"Quis custodiet ipsos custodes?"

I am, yours, &c.,

JOHN SPILLER.

See also the fact that the solution of caoutchouc in alcohol, to which a small quantity of sulphuric acid is added, is not only a good solvent for caoutchouc, but also a good solvent for the monstium, soon after the addition of alcohol. When alcohol is added to the solution, the latter does not any longer remain in the solution, but simply softens it, and renders it more easily soluble. Alcohol also precipitates the monstium from native petroleum, or coal tar, it is not so that it is its former bulk; and if then triturated with a small quantity of alcohol, it affords a homogeneous mass, the same that is used in preparing the patent varnish of both of Mackintosh. Caoutchouc dissolves in the oil of olive, such as linseed oil, but the varnish has not the property of being concrete on exposure to the air. Caoutchouc melts at a heat of about 230° or 250°; after it has been melted, it does not solidify on cooling, but forms a sticky mass which does not become solid even when exposed to the air for months. Owing to this property, it furnishes a valuable material for the lubrication of stopcocks and joints intended to remain at tight and yet be movable.—*Scientific American*.

To Correspondents.

7. AMMONIUM IODIDE.—The phenomenon you describe is by no means uncommon; we have seen it many times. The dark colour being developed in the collodion was, as you conjecture, the result of the liberation of free iodine. This was due to some trace of acidity in the ether. It is a very common thing to find sulphuric ether purchased of an ordinary chemist somewhat acid; and ether kept in a photographer's establishment, in a bottle not quite full, and exposed to light, will frequently become acid. The change back again from dark red to a comparatively colourless state is, although by no means uncommon, not so certainly explained. We have often seen it, but never except methylated ether or methylated spirit was present; and the probable explanation is that an iodide of methyl is formed, taking up the free iodine liberated.

H. HOBBS.—We cannot give you a full explanation, because we are not quite certain of all the steps in the alleged process, of which the paragraph in question was, you would see, merely a brief summary extracted from another journal. It is very probable that "and" should be substituted for "or." You are aware that a wash of iodide of potassium will destroy the sensitiveness of an exposed plate, and that exposure to light is supposed, in some processes, to improve the plate after it has been made insensitive by an iodide. The special novelty consists, apparently, in final treatment with a solution of tannin, instead of a solution of silver. Dr. Vogel has proved that tannin acts as a sensitizer to iodide of silver. Of course, after the plate has been treated with the tannin, it will require the same care to protect it from light as an ordinary plate rendered sensitive in the silver bath.

Z. DODSON.—You are still scarcely sufficiently explicit as to the character of the photographs you possess, and the mode of exhibiting them which you wish to try. Are they transparencies, and do you wish to exhibit enlarged images of them on a screen by the aid of the magic lantern? Or are they paper prints, and, by using them for a "peep-show" do you mean to enclose them in a box with a good light upon them, and exhibit them through a large lens? In either case you will be able to obtain the requisite apparatus through some dealer in photographic instruments. See second page of our advertising sheet. 2. The collodion which is too thick may be diluted either with new thin collodion, or with equal parts of ether and alcohol.

F. A.—A quarter-plate portrait lens will answer well. As a rule, the focus of the condenser should be about twice its diameter.

NORMAN MAY.—The new edition of Vogel's Handbook has just arrived. You will duly receive attention.

ALFRED CHARDON.—The use of permanganate of potash for intensifying carbon prints or negatives was indicated by Mr. Swan some years ago. We will, however, at an early date refer to the communication, and furnish you with details. Many thanks.

SUCCESSOR.—The irregular light patches in the prints enclosed spring doubtless, as you state, from patches of greater density in the negative, and these may have been produced in various ways. They appear to us very like the results produced from an uneven coating of collodion. If the collodion flow in an uneven wave, leaving thick ridges or patches, such results might follow. Sometimes the silver solution flowing unevenly over the surface will cause such patches in development. Sometimes a reflection of light falling on the plate whilst in the camera will produce such effects. Sometimes the uneven flowing of the developer will produce such a result. The first cause we have mentioned is most likely, from the appearance of the patch, where it is most apparent.

HYDRATE OF CHLORAL.—Dallastype is the name given by the inventor to a method of producing, by photography, blocks for surface printing in the ordinary typographic press. The method is a secret of which we know nothing whatever. 2. To get an image produced by the powder process, to receive an electro deposit of copper, will necessarily be difficult, because such an image does not consist of a continuous metallic surface, all the shadows, for instance, having no deposit of plumbago, at once stop the connection. 3. As a rule you will find experts in any profession, whether French or English, very shy of showing their mode of working; and in a new branch of art like photo-mechanical printing, where much had to be worked out by each individual experimentalist, this is not unnatural. 4. A cupboard with a jar of sulphuric acid, or of dry chloride of calcium, will help you to dry gelatine films; but as a rule, space, and a draught of dry, warm air will answer best.

NON NOBIS.—During the last twelve years you will find many summaries of lectures on photography given in our pages which will help you considerably. In the volume for 1867, for instance, you will find many extracts from an article in the *British Quarterly Review* which will furnish you with much material. If you have, or can have, access to a magnesium lamp, you may take a portrait with the full aperture of a portrait lens; or you may print a transparency on a wet or dry plate by the aid of an ordinary gas flame. If you have facilities you may show the development on a screen by means of the magic lantern. To do this you must make a cell of two plates of glass, with strips of glass for sides and bottom, joined by means of marine glue or shellac. Fill this with developing solution, place the exposed plate therein, and then put the cell in the place of the slide in the lantern, when the gradually developing image will be thrown on the screen. A tolerably powerful light will be necessary to show this well. On page 520 of our last volume you will find an abstract of a lecture on photography; and there are various others in our back volumes. The article to which we referred in the *British Quarterly Review* appeared in the number for October, 1866. It is published by Jackson, Walford, and Hodder. It will help you considerably. We regret that our engagements do not permit us to write privately on the subject.

D. K. GRIFFITHS.—Many thanks. Proof shall be forwarded, and also date of the insertion of communication to which you refer.

A. YOUNG PHOTOGRAPHER.—We have, in the volume of the *PHOTOGRAPHIC NEWS* and in the *YEAR-BOOKS*, already published given very many articles on the production of transparencies for the magic lantern. Whilst we aim at frequent intervals to give practical articles on the usual practice of the art in all departments, the primary object of a journal is to give a record of the progress of photography, its discoveries, modifications, and improvements, rather than to repeat known processes, which we have already published. If you have our back volumes, you will, on reference to the indexes, find many articles on the subject of your enquiry. We do not remember that the gentleman to whom you refer has published any details of the process he works. Professional men working a speciality often feel indisposed to enter into such detail. If you will tell us the methods you have tried, and any special difficulties you have encountered, we can probably help you. In the meantime, we will bear in mind your wish, and when opportunity serves give a résumé of the most approved practice.

A. BOUCHER.—Many thanks.

AN OLD MEMBER.—We cannot give any precise information on the subject, and it is not wise to discuss it on conjectural information. You will probably obtain this information on enquiry at the meeting. We understand that some voting papers were rejected, but on what ground we cannot state. The name to which you refer was, by the owner's wish, not nominated for the council. Is it not well, for the Society's sake, to let the whole matter rest?

ERRATA.—In our list of officers of the Photographic Society the name of Mr. H. Baden Pritchard was accidentally omitted. It should have stood fourth in the list of the council. In the letter of Mr. C. Ferrant, published a fortnight ago, on "Life-size Portraits," first line of second column, page 70, for a "deal of gratitude" read "debt of gratitude;" and in last line of second paragraph of the same column, for "make the attempt" read "made the attempt."

Several Correspondents in our next.

The Photographic News, February 26, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

DIFFICULTIES IN PORTRAIT PHOTOGRAPHY.—THE EAST INDIAN ECLIPSE EXPEDITION AND DR. VOGEL.—ACTION OF LIGHT ON ANILINE COLOURS.

Difficulties in Portrait Photography.—Some years ago there were many things inveighed against by portrait photographers, who avowed they could never produce satisfactory results for their sitters if the latter came dressed in garments unfavourable to photography. Blue dresses, for instance, were disliked, because they came out light; and white muslin jackets, or gauze, or tulle, photographers assured you, would only result in blurred or glaring high lights, without definition or detail. In like manner, it was considered the height of folly to attempt to photograph in a drawing room, or some such apartment; and a glazed structure, with as little shelter about it as a cucumber frame, was held to be the only place in which bright and vigorous portraits could be secured. Gradually these impressions, which had taken deep root in the minds of most photographers, began to disperse, as pictures by masters in the art demonstrated clearly enough that many things of this kind, hitherto considered impossible, were quite within the reach of the artist, if he only gave sufficient attention to the matter, and took pains in carrying out what his experience taught him. Indeed, it has been found that, by employing light and gauzy drapery, artistically disposed about a portrait, the very finest effects may be produced; and what some years ago was generally shunned by the photographer is now regarded (at any rate by those who understand their profession) with a very favourable eye. We may not have got over the difficulty of rendering a blue dress of the same deep shade as it appears in nature, but, nevertheless, the soft delicate white by which blue is usually rendered in photography is one of the most agreeable tones that the camera can give us. The difficulties which beset the beginner in portraiture usually turn out to be benefits in the end, when he has surmounted them, for the degree of skill with which objects difficult to reproduce are rendered by the camera proves the calibre of the man who does the work. The well-known photographer, Fritz Luckhardt, has recently executed a most charming picture of a bride which well illustrates our meaning; for the cloud of diaphanous muslin that falls over the bridal garments is so delicate and full of detail that it does not in any way interfere with the folds of white silk that appear underneath. It calls to mind Robinson's "The First Bridemaid," which will still be remembered by many, and which was a similar, and equally successful, attempt to triumph over some of the greatest difficulties of our art. That there is still a necessity for instructing the public on the matter of dress requisite for the securing of a happy portrait and picture remains very true at the present moment, large checks, decided patterns, and such like materials, seldom conducing to the production of a good result; but it is patent to all that we have lately progressed in a marked degree towards solving some of those problems which gave portraitists in earlier days so much trouble.

The East Indian Eclipse and Dr. Vogel.—Our readers will be glad to learn that our friend Dr. Vogel, of Berlin, will take part in the British eclipse expedition, which is now on its way to Singapore. The Royal Society issued invitations to three foreign gentlemen to take part in the observations: Dr. Vogel will represent Germany; M. Janssen goes on behalf of France; and Prof. Tacchini will be the Italian *savau* chosen. The main object to be secured will be a photograph, or rather a series of photographs, of the spectrum of the sun's corona. The whole expedition is under the charge of Dr. Schuster, who sailed ten days ago for the East. M. Janssen is already at Singapore, awaiting

the arrival of the expedition, having just completed his labours connected with the transit of Venus observations; and M. Tacchini is at present at Calcutta. Dr. Vogel has hastily thrown up his appointment for a while at Berlin, leaving the editorship of the *Mittheilungen* in the hands of two of his colleagues, and will join the expedition at Suez. Certainly two more able and experienced men for the purpose could not have been selected than M. Janssen and Dr. Vogel, for both of them have had considerable experience in photographing the heavenly bodies, and have, indeed, made this branch of science their particular study. The observers proceed to Camorta, in the East Indies, where, it is stated, totality lasts four minutes twenty-seven seconds. The invitation from the King of Siam has not, we believe, been accepted, for the reason, probably, that that kingdom is not just now in a settled state so far as politics are concerned. We certainly could have wished that our *savans* could have taken advantage of so kindly a request, for, beyond the question immediately at hand, a capital opportunity would have been afforded of learning something more definite on many points in regard to that interesting country. We may inform our readers that Dr. Vogel promises to send a record of his journey and experiences at the first opportunity, and this we shall take care to give special prominence to. His letters from Aden and from Sicily on the occasion of the last two eclipses in which he took part are probably still in the memory of our readers, and his experiences have been exceedingly valuable to all who have an interest in astronomical photography. This is the second time that Dr. Vogel has consented to act in company with a British scientific expedition, for it will be remembered that he was a colleague of Mr. Norman Lockyer when that gentleman had charge of a Mediterranean party a few years back. Dr. Vogel's intimate acquaintance with the English language stands him in good stead on these occasions.

Action of Light on Aniline Colours.—M. Borlinetto, in the *Rivista*, has given an account of some experiments he has been making to test the sensitiveness to light of aniline colours. He mixed them with various substances, such as starch, gelatine, and albumen—or, rather, spread the pigments upon papers prepared with these materials. He found that Hofmann's blue changed its colour quickest upon starch-paper, and more slowly upon the sized and albumenized papers. Fuchsine, aniline green, and picric acid, behaved in a similar manner; but the most sensitive of all the colours was Bismark brown. When this pigment upon paper was put under a negative, it yielded the best picture, which was capable of being fixed by a solution of iron containing a little alcohol. A very clear image may be obtained by adding Bismark brown, dissolved in alcohol, to raw collodion. A plate is coated with this mixture, dried, and exposed to light under a cliché, the image that results being fixed in the way described. As a general rule, the permanence of the colour is greatest when an animal substance is present. We have, therefore, judging from M. Borlinetto's experiments, a material here which might be useful to photographers under some circumstances, although, as the investigator observes, the sensitiveness of the colours, compared to that of the silver salts, is very slight indeed. It is questionable, too, whether the images could be fixed at all in a permanent manner without injuring their appearance in some degree; and it stands to reason that if the beautiful tints obtained through the medium of aniline are in any way affected by the treatment they receive, their value would be very materially lessened. Any of our readers who desire to make experiment with the colours may do so at very little expense, for small quantities may now be purchased at a trifling expense, and a mere trace of the colours is sufficient for such experiments as are here described. The recommendations which have of late been made to photographers to stain their pictures with these pigments should, in the face of these results, be received with some caution.

FRENCH CORRESPONDENCE.

PHOTOGRAPHY AND OCEANIC STORMS—A FRENCH MANUAL ON CARBON PRINTING—PREPARATION OF THE PIGMENTS—PORTRAITS IN CARBON—SULPHOCYANIDE OF AMMONIUM FOR PRINTING.

PHOTOGRAPHY, which has rendered such important services to astronomy on the occasion of the transit of Venus, may certainly find other similar applications in the domain of science. Thus the different theories which have been advanced hitherto touching the movement of a ship upon a stormy sea have only been of an approximate character. Photography offers us the means of registering with mathematical accuracy the successive inclinations impressed by the billows, and in this way it would be possible to learn something of the law that governs the movements of the ocean. Some curious experiments, the results of which have been communicated to the Academy of Sciences, have been made at Brest by an officer of the French navy. I need not enter into the description of the process employed, because it would lead into too abstruse matters; but I will say that the impressions exhibited to the Academy have excited a most lively interest, and appear to be of a most conclusive character.

One of the veteran photographers in pigments—M. Boivin, of Mans—has sent me the manuscript of a very clever and complete manual of this method of printing, which, as I mentioned in my last letter, has at last obtained a firm footing among the professional photographers of France; this work is the fruit of several years' study and observation, controlled by experience.

The teachings that the author draws from his long practical studies are the following:—The sensitizing of the pigmented paper should take place in a cold bichromate bath. The drying of the tissue should be conducted in a warm and airy apartment. The solubility of the pigmented paper should be ascertained before placing it under the *cliche*. The tissue requires to be printed with accuracy, as determined by the aid of a photometer. The washing of the pigmented tissue after printing should be as rapid as possible, and the contact between it and the transfer paper must be as perfect as possible. The image must be developed in water, which should not be too warm, and ought to be filtered if necessary. The fixing takes place in a solution of alum, of three or four per cent. strength.

As to the failures which may be encountered in the process, M. Boivin resumes as follows:—Where the contact between the tissue and the transport paper is faulty, a portion of the half-tones is lost, and one is liable to partial lighting of the film. The operator should take heed not to change the temperature of the water too suddenly which is used for development. Filtered rain water is best to use for the purpose. An image rendered yellow by the bichromate may be made white again by passing it into a two per cent. bulk of cyanide of potassium. If the exposure has been too short, the half-tones are wanting; if it has been too long, on the other hand, the impression is thickened, and refuses to develop.

The preparation of the colouring mixture which composes the pigmented tissue is one of the most important points in the process, and M. Boivin makes, in reference to the subject, the following observations:—In preparing black tissue, employment can be made of lamp-black such as may be obtained in commerce, well purified, and finely ground. It is mixed in a mortar with glycerine and a trace of phenic acid, and in this state it will be found to keep perfectly. If ordinary soot is to be used, it is necessary in the first instance to separate the grease from it, and this is done by washing it in benzole, and then in potash, ammonia, and water. For carmine black (a tone which comes very close to the tint of ordinary photographs) refined lampblack is taken, and to it are added a few drops of an ammoniacal solution of carmine. Such pigments as

red chalk, and the like, are prepared by washing and levigation so that an impalpable powder is secured.

The pigments are put into a fine linen cloth, of which a bag is made by tying with string; this is dipped into warm water in the same way as if you were using a stick of Indian ink. When the water is very much charged with colouring matter, it is poured into a glass vessel, and the operation is continued until the pigment has all gone. After having allowed the liquid to stand for some time, so that the coarser particles have had time to settle, two-thirds of the solution are decanted off, and the precipitate which is afterwards obtained from this serves as a pigment for the tissue. It is preserved with glycerine and a trace of phenic acid, in the same way as the lamp black. If it is desired to employ sepia, in order to render it without any action upon gelatine, it is boiled first of all with a saturated solution of bichromate of ammonia, and then thrown upon a filter, and, by means of ordinary water, the precipitate is washed repeatedly, and is then ready for use. Thus prepared, the sepia employed in the preparation of the pigmented tissue has not the inconveniences of sepia in its natural state, which renders gelatine perfectly insoluble in a very little while. As to plumbago, which is employed in certain instances, this is reduced to an impalpable powder in the mortar, and is then diluted with glycerine, which is then preserved in a pasty condition. Prints produced with plumbago resemble very much drawings in crayon, and are of a very artistic nature.

One of the most interesting sections of M. Boivin's work is that concerning the production of a print in its true sense by double transfer. He assures us that the operation may be easily performed as follows:—After having well cleaned a plate, it is rubbed with a flannel cloth upon which a little wax dissolved in benzole or petroleum oil is adherent. After having allowed the solvent to evaporate, which takes place in a few minutes, the glass plate is rubbed uniformly with a very dry flannel, so that no very large amount of wax remains on its surface. The plate is preserved in this state, and when required for use the surface is coated with old collodion that has been rendered very fluid by the addition of alcohol and ether. The plates are then plunged into a water bath, where they remain whilst the printed tissue is being washed in another vessel; then the tissue is placed upon the film of collodion and withdrawn from the bath, and, having passed the squeegee over the image to ensure perfect contact, the same is allowed to dry spontaneously. After dediccation it is merely necessary to lift up the print in order to detach it from the glass. Instead of a solution of wax, of which mention has been made, M. Boivin employs very successfully castor oil, or even stearine dissolved in alcohol; all these materials give identical results. This process of double transfer furnishes prints which rival the best that can be obtained with silver printing. Thus M. Boivin observes they are at once in their proper condition, and glazed; the method therefore is especially suitable for cartes-de-visite and portraits of this nature. In the reproduction of engravings in which a fine matt tone is desired, no collodion or gelatine should be used; in this case it is preferable to employ paper as the definite basis—gelatino-alum paper, for instance.

I have often had occasion to speak of the advantages which sulphocyanide of ammonium presents over cyanide of potassium, and even hyposulphite of soda, for fixing positive prints. This salt has none of the dangers which all operators run the risk of when they employ cyanide of potassium, and it has not, like hyposulphite of soda, the inconvenience of producing a sulphuration of the prints. Nevertheless, sulphocyanide is but little employed, and the reason is that its price is rather an elevated one. This remark having been made to M. Meynier (who, it may be remembered, is the introducer of this salt into photographic manipulations, and who manufactures it on a large scale),

that gentleman has written me a few lines on the subject which it will be useful to all to know. M. Meynier, as a manufacturing chemist, produces the salt at two francs and a half per kilogramme, and at this price it is sold wholesale to chemists, who retail it again at about six or eight francs. This is a fact which has an interest for every photographer. The agent in Paris, it appears, contents himself with a profit of half a franc only per kilo, and if all chemists were to do the same, it is certain that sulphocyanide would be generally used for fixing, and a great demand for the material would arise, so that vendors would soon recoup themselves for any abatement they might make in the price now charged for the product.

ERNEST LACAN.

THE PRACTICAL PRINTER IN AMERICA. XVIII.

"A FEW MORE REMARKS ABOUT PRINTING—TREATMENT OF BROKEN NEGATIVES.

"In my chapter on The Positive Bath for Albumenized Paper, I have given a variety of formulæ for both preparing and taking care of the printing-baths, which I have either by my own, or by the experience of some photographic friend, proved to be very fine in their results, if carried out as recommended.

"When some samples of paper are floated upon the silver bath, a treatment is required which at first seems peculiar. If you float this paper upon a medium-strong silver bath (40 to 45 grains strong in summer), it will have to be floated a long time to obtain good results, and if floated upon a weak silver bath (25 to 30 grains strong, also in summer) it will have to be floated a short time. The reason of this is obvious. A strong silver bath repels the paper at first for quite a number of seconds, and if removed from the bath before the paper has taken to it, it will dry in tear-drops, and when printed it will be marbled in its looks, which is in itself a sure sign of too short silvering. If the paper when removed from the bath curls considerably, then that is another sign of too short silvering, and, consequently, paper silvered on a strong silver bath should be silvered for a longer time than what you would silver the same on a weak bath, and then the paper will have a strong solution on it, and will be very brilliant, both when just removed from the printing-frame and when dried and finished; but it will be very much bronzed in the shadows. For weak or flat negatives that paper would be just the thing; while for medium—i.e., neither intense nor weak negatives—it would not, and for the intense negatives it would be sadly out of place.

"For medium negatives, the bath for sensitizing the paper should be from 28 to 33 grains strong, of silver alone, to the ounce of water during the summer; and while you float in the former case on a bath of 45 grains, from thirty-five to fifty seconds, you should not in this case float more than from twenty to twenty-five seconds. If you float some samples of paper on a 30 to 33-grain bath longer than twenty-five seconds the paper will print 'woolly,' even if silvered only five seconds more than the allotted time. The paper is easily told as to whether it will print woolly or not by examining the surface of the freshly silvered sheet as soon as it is removed from the bath; if it looks dead and sunk-in you may be assured that it will look exactly so when it is printed. The experienced printer, when he removes the first sheet of paper from the bath, can tell whether he is silvering the right time or not (at least, very nearly), and then he can act accordingly, with astonishing accuracy.

"There are often very bad results occasioned by having the silver solution too cold. This is especially the case in the winter. Look out for it, if you wish to avoid trouble, both in the sensitizing and working of the paper. During the hot months of summer the paper should be kept in a damp box for a day or so before it is silvered, for when

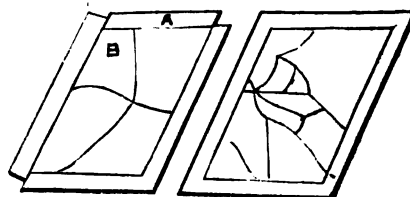
the albumen on the paper is in a damp state it will more readily take to the bath than when it is dry and horny. During the winter the paper should not be kept in a hot room, for the same reason.

"*Treatment of Broken Negatives.*—In many cases, a negative that has been broken can be mended so as to be strong enough to resist all ordinary pressure of the back-board while printing, providing another glass is first laid in the frame and the negative laid on it.

"Lay a piece of cotton flannel on a level bench or table where there is plenty of light, and match the broken pieces of the negative on it, face up. Examine the pieces closely with a magnifying glass, and lay them in exactly the position they were in before the negative was broken. Now cut strips of plain, unsalted paper, about an inch wide—no more, though—and apply melted glue to one side of them; now place the same side of the paper to the borders of the negative, permitting about half an inch of the width to project out beyond the glass. Do this to all of the sides, and then turn them over the edge—i.e., the thickness of the glass—on the varnished side of the negative, and rub the paper with a tuft of cotton in close contact with the glass. The negative, as it is now, has a half-inch strip of paper glued to the four sides of the varnished side of it, and also a half-inch strip projecting out beyond the edges of the negative, which has glue on it, but is not as yet stuck to the other side (Fig. 1). When the paper is

Fig. 1.

Fig. 2.



dry, turn this negative over and apply moisture to the glue on the paper, and draw it tightly, yet tenderly, over the edges of the glass, and press it down smoothly on the back of the negative. Do this in turn to all the sides, and then, when the paper is dry, you will find the pieces quite strongly held together, and you can move it about in and out of the frame, without any danger of the pieces separating.

"But, however, if these strips of paper do not hold the negative sufficiently together, as in some cases they will not, then lay the negative, face up, on a piece of plain unsalted paper, match it, and with a knife or shears cut the paper around the negative, leaving sufficient of it on all sides to allow it to turn over, not too far, on the varnished side, which you remember is uppermost (Fig. 2). Mark with a lead-pencil on the paper on all sides of the negative, close to the edge of the paper. Now remove the negative and apply glue to the side of the paper which has been marked. Apply evenly, and lay the pieces of the negative quickly on in their proper position, before the glue has commenced to dry. Bear in mind that the glass or back part of the negative is laid down on the glued paper, and see also that the negative when placed together lies on the paper as it did before you removed it to glue the paper, which position is easily told by the marked lines on the paper.

"When the pieces are matched exactly by the aid of a magnifying glass, then gently draw the paper up which projects out beyond the sides of the negative, and stick them to the varnished side of the glass. This paper should not cover so much of the varnished side as to cover any part of the negative that is to come in the print when trimmed. The negative should then be turned over, which can very well be done if you were, in the first place, to place under both paper and negative a whole glass of the same size, or a little larger if desired, as the mended

negative would measure. By taking hold of this under glass, and placing a couple of fingers on the broken negative to prevent it from slipping, you can easily turn it over, and then lay it on a level stand covered with soft flannel. Now rub with a tuft of cotton the paper which is stuck on the back of the negative, commencing at the middle and rubbing outwards, so as to secure both perfect contact and for the purpose of removing air-bubbles between the two surfaces. Let dry, and you will have a negative that can be printed, if you wish, without another glass being placed first in the frame, and which can now be packed away as if unbroken.

"This negative having a thick white paper on the back of it, will necessarily print slowly, but if printed face up to the strongest sunlight, but little difference in the time of printing will be noticed. Medallions or plain prints can best be made from such a negative, though it may be vignettied by placing a Wymouth vignette-paper on the back of it. The contraction while drying of the expanded paper will draw the pieces of the negative more firmly together, and thus secure greater exactness."

THE CAUSE OF SOLAR HEAT.

BY DAVID WINSTANLEY.*

WHEN a body possessing the visible energy of mechanical translation is arrested in its course, that energy, according to the laws of conservation, is not destroyed, but becomes apparent in another form, generally in the form of heat. Should a body receive two equal impulses in diametrically opposite directions at the same time, mechanical translation as a result thereof is impossible, and the energy thus expended, it appears to be agreed, will in the main assume the form of heat. Should a body, however, receive two equal impulses in directions inclined to each other, mechanical translation will ensue, but the value of the energy of visible motion thus communicated to the body in question is not equal to the sum of the impulses, being, as is well known, justly represented by the diagonal of a parallelogram the length of whose sides is proportioned to the value of the primal impulses. What, then, in this case, becomes of the residue of energy applied, and not converted into visible motion? I apprehend it assumes the form of heat. If so, in the instance of a body receiving equal impulses in directions inclined to each other at an angle of 120° , the resulting visible motion will just account for the energy of one of these impulses, and the resulting heat for the energy of the other. If, then, a body having a certain amount of visible energy observable as rectilinear movement have a series of impulses imparted at an angle of 120° in each instance to the line of motion, and equal in value to the visible energy of the body at the time of application, the body in question will gain nothing in visible motion through the application of these impulses, but will simply alter the direction of its movement at each application, and acquire at the same time an amount of heat of which the impulse is the mechanical equivalent. Adopting this view, it matters not at what angle the impulse may be given, for so long as the figure representing its amount yields with that representing the visible motion of our body a parallelogram whose resultant is equal to the line of visible motion, it follows that the energy of mechanical translation remains unaltered, and the energy of the impulse becomes wholly transformed into heat. This condition of things, however, is what obtains in the instance of a body in planetary revolution in a circular orbit. It is continually receiving impulses through the instrumentality of gravitation at or nearly at right angles to its line of flight, and its energy of visible motion does not increase, whence I infer that the mechanical energy by which its rectilinear movement is destroyed is converted into an equivalent of heat which

elevates the temperature of the planet so far as its conditions of radiation will permit. The aggregate value of the impulses required to make a body describe a circle and return to its primal position and direction without loss or gain of visible energy, I have endeavoured to determine graphically by means of the mechanical parallelogram. The result at which I arrive is, that the aggregate in question exceeds the momentum of the body to be deviated in the same proportion as the circumference of a circle exceeds its radius, and this irrespective of the circle's size. I have not attempted to calculate the temperature to which the matter of the earth would be elevated by a sudden stoppage in its orbital path, for it appears to me that satisfactory data for doing this do not exist. The number of thermal units to which such a stoppage would give rise if multiplied by 6.28 indicate the amount of heat which, upon the present hypothesis, the earth annually receives through the instrumentality of solar gravitation. This amount will, I apprehend, amply account for a certain initial temperature of the terrestrial matter, and for that excess of internal heat which appears to have been pretty well made out. It will be evident that any heat which, in virtue of this hypothesis, may be supposed to fall to the lot of our earth, will, in some calculable proportion, fall to the lot of the other planets also. That proportion I apprehend to be directly as the planet's mass multiplied into its velocity in orbit, and divided by its periodic time. Of course this amount of heat will be distributed over the entire matter of the planet, the temperature of which will depend on the capacity for heat of the matter composing it, and on its facilities for radiation. These latter will clearly diminish with the comparative diminution of superficies enjoyed by the larger planets, and with the extension of their atmospheres. In the case of bodies moving in elliptic orbits, the amount of energy which, according to this hypothesis, will be transformed to heat in a single revolution will be practically as before; i.e., 6.28 times the planet's visible energy of motion at its mean distance from the sun. There will, however, be this difference between the two cases: in the instance of a body moving in a circular orbit, the accession of heat will be a constant quantity in equal increments of time and in all parts of the orbit, whereas in the case of a body moving in an ellipse, the accession will be least in approaching the perihelion, and greatest in receding from it, inasmuch as the solar gravitation produces an increase of mechanical translation in the former instance, and a diminution in the latter. Assuming the theory to be correct, this circumstance is one which will greatly mitigate the extremes of heat to which, apart from such a consideration, we should expect cometic bodies to be subject. Indeed, in spite of the enormous distances to which they recede from the sun, the voluminous nature of their atmospheres, by which radiation must be diminished, may, in conjunction with this view of the case, afford an explanation of the unexpectedly high temperature which, in the case of these bodies, the spectroscope certainly seems to indicate.

The application of the views herein advanced to an explanation of the cause of solar heat is briefly this:—As the mutual and ever-acting gravitation of the sun and his attendant planets produces in the instance of the central luminary no more acceleration of visible motion than in the instance of the planets themselves, the gravitation must result in the exhibition of some other form of energy, which, in the one case as in the other, will, I apprehend, be the form of heat. Carrying, however, this idea to the extreme, we should be led to infer that the force of gravitation, which in some circumstances is certainly capable of transference into the form of mechanical translation, and thence into the form of heat, is in others just as capable of transformation in the opposite order. Indeed, if heat is to be regarded as the individual movement of a multitude of particles whose simultaneous movement is observable as mechanical translation, it is but reasonable to suppose that

* Read before the Manchester Philosophical Society.

a force acting upon all, but, from the circumstances of the case, incapable of producing a simultaneous and concordant movement, will produce an individual, and in a sense discordant, motion of those same particles. Looking at the matter in this way, any agglomeration of particles whatever must have some initial heat as a result of that gravitation which is unable to evince itself as mechanical translation. And as in our experience gravity is unceasing, this heat, so far as we can see, should be never ending during the continuance of those conditions which prevent the movement of translation; and a never-ending supply of heat must cause an elevation of temperature which will only cease when a point is reached at which the rapidity of radiation equals the rapidity of supply. The more numerous the particles composing the agglomerated body, the less become the opportunities of radiation, and the more elevated the temperature, which latter attains its maximum in our own system in the instance of the stupendous body which maintains the superficial mundane heat by irradiation from its fires.

It will be seen that the theory here projected places itself in antagonism with the doctrine that "a stone high up" has anything which can be justly termed "the energy of position." But I have already occupied sufficient time without staying now to combat further the doctrine I have named.

To those who have been accustomed to regard gravitation as a property which enables bodies to act where they are not, the present considerations will present difficulties not encountered by others who accept the beautiful, and to my thinking more rational, hypothesis that the simple mechanical movement of infinitesimal particles is the immediate cause of that grand effect, the law of universal gravitation.

ON THE CAUSE OF DEPOSITS OF SILVER UPON WET COLLODION.

BY G. VANDER MENSBRUGGHE.*

I HAVE been giving some attention to the subject of irregular deposits of silver which are very often seen upon wet collodion plates during development. In order to explain clearly the remarks I have to make on the subject, I may state, first of all, that every liquid possesses at its surface a tension or contractile force of its own, which diminishes as the temperature becomes more elevated. For this reason the same phenomena take place as if there was a skin or membrane stretched evenly over the surface, supposing the temperature to be uniform, the tension being greatest where the temperature is lowest. It follows from this, that if we suppose a superficial film of a liquid, without weight, non-adherent to a solid body, and perfectly free to obey the interior forces that exist, this film will contract at once, and assume a spherical shape, corresponding to the least possible surface for any given volume. Weight alters more or less, but does not destroy this construction, as proved by the spherical form of rain, soap-bubbles, &c.

The fresh surface of distilled water at a temperature of 15° Cent. possesses a tension or contractile force about equal to 7.5 milligrammes per millimetre of length, while the tension of ether, at the same temperature, is only 1.9 milligrammes, and that of alcohol 2.5 milligrammes. It follows, therefore, that if we plunge a plate of glass into distilled water, and then withdraw it with a pair of perfectly clean pincers, and deposit upon the film of water adhering to the surface of the plate a drop of alcohol or ether, the plate being held horizontally the while, the tension of water, being much stronger than that of the ether or alcohol, will produce a rapid spreading of the drop, and the liquid film will thus possess thickness of a

very different nature at different places over the surface of the plate. The same phenomenon takes place when distilled water is substituted for a solution of silver.

It is clear, after these experiments, which are easy of repetition, that if the liquid film covering the plate, after it has been withdrawn from the silver bath, contains here and there little quantities of ether and alcohol, there are necessarily produced phenomena of dilation at those places where ether and alcohol are to be found. Therefore the film will be more or less unequally distributed, and the chemical actions developed by the luminous rays will themselves be very irregular at certain points.

As soon as the quantity of ether and alcohol mixed in the bath becomes large, the film adhering to the plate may contain these liquids in every part, and then the phenomena of dilation are less pronounced, or even nil, provided the evaporation of the plate is the same throughout. Now this last condition of things is very difficult to realise, and thus the warmest portions are more or less attracted towards the colder places.

In general, it is necessary, in order to obtain a regular distribution of the liquid film covering the plate, not to place it in contact with any body of a greasy nature, nor to touch it even with the fingers, for there always become detached little particles of grease, which, although invisible, are quite sufficient to dilate the liquid on the plate by reason of its weak superficial tension.

To render this more intelligible, I may quote the following experiment. Into a large dish, cleaned with scrupulous care, there is poured some distilled water, and upon the surface of this is deposited a few small pieces of camphor, not more than one millimetre in size. They will be found to begin to turn rapidly, moving about with extreme vivacity; these movements are due to the fact that there separate from the surface of camphor in contact with the water very minute quantities of essential oil, possessing a much less contractile force than water; and as this oil does not detach itself equally all over the surface of the atom in contact with the superficial film of water, it moves about with unequal force. If we plunge a finger into distilled water, every movement of these particles ceases as if by magic. This is because invisible greasy matter has become detached from the finger, and has diminished too sensibly the tension of the liquid to permit of the particles of camphor being set in motion.

These experiments demonstrate, I think, the necessity of some precautions to prevent deposits of silver of irregular character from taking place during development.

1. To attenuate the differences of tension of ether, alcohol, and the silver bath, by adding any inactive substance to the latter, and to lower the tension of nitrate of silver. The addition of camphor to the silver bath is said to prevent the blistering of paper sensitized upon it; perhaps this remedy acts from an analogous reason.

2. To render as short as possible the differences in temperature of different portions of the sensitive collodion plate, for the tension diminishes as the temperature augments, and thus the warmest portions are drawn towards the coldest. This remark seems to me to give the key to many failures with which photographers are afflicted during very hot and very cold weather.

In conclusion, I will mention a substance which acts like camphor, and which will thus be of assistance to operators in preventing irregularities in the thickness of liquids. I refer to saponine. A very weak solution of this (one per cent., for instance) possesses the singular property, discovered by M. Plateau, to oppose great resistance to every displacement of surface, or, in other words, it enjoys very great superficial viscosity; I believe further, that it is inert, and, therefore, the addition of it in minute quantities to a liquid might be advantageous.

Should the preceding conjectures be borne out by experience, the theory of the superficial tension of liquids will be of undisputed significance in photography.

* Association Belge de la Photographie.

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"REMBRANDT" AND OTHER EFFECTS IN PHOTOGRAPHIC PORTRAITURE.

WE always regard with pleasure, as a healthy and satisfactory symptom, the reading of papers on the artistic side of photography before societies. Three such papers, each containing much both of interest and of valuable practical suggestion, have been recently read: one before the South London, and two before the Edinburgh Society. It has been often remarked that of pictorial art, as of poetry, the faculty must be in-born, as no study, no training, without the natural instinct, would ever make an artist. Ruskin suggests that mere painstaking is valueless without something much higher, when he remarks that "patience and sand-paper will not make a picture." All this is true enough in relation to the higher forms and higher qualities of art, and true enough in relation to the highest qualities possible in photography. No study, no training, would have made a Rejlander, his work distinctly being the produce of a creative faculty. But an artistic instinct may lie dormant, and require educating and developing. Interest in good art, and familiarity with the best examples, have a wonderfully educating influence. Knowledge of what constitutes good art is one of the most important elements in the education of the artist, and that is a thing which can, to a considerable extent, be acquired by study. Hence the reading of papers on such subjects, and their consideration and discussion, cannot fail to have a valuable influence in raising the general standard of art amongst photographers. It is very important, however, to avoid error as far as possible in such papers and such discussions, and in proportion to the excellence and weight of the dicta becomes the danger of error, as the error may easily gain the authoritative weight of truth from being found in its company.

The immediate purpose of our reference here is to call attention to certain allusions which occur in each of the papers to which we have just adverted, and to remarks in the discussions which followed. It has often been the custom of late to refer with considerable disparagement to a style of portraiture which has acquired very much vogue during the last few years, and which is distinguished by the name of "Rembrandt." The name is probably foolish enough, inasmuch as it provokes comparison which must often be fatal to the photograph. The intention, however, in adopting the designation is plain enough. The general custom in photographic portraiture, which prevailed for many years, was to flood the sitter with as much light as could possibly be used with any chance of securing fairly rendered contours and some degree of relief. In what is termed the "Rembrandt" portrait the avowed aim is to secure a similar prevalence of shadow and half shadow to

that which characterized the works of the great master of *chiaroscuro*; and the mode of securing this effect was—to compare great things with small—not unlike that used by the painter; in both cases the sitter being illumined by light from a narrow, concentrated source. But passing by the somewhat unwisely ambitious name, let us glance for a moment at the thing. In doing this, let it be understood at once that we do not take the failures as the type, any more than we condemn a system because of its abuse. The black faces, with a streak of light indicating the outline of a nose, are really travesties of the style. He who imitates a style because it is in fashion (not because he appreciates it, or comprehends its intention) generally burlesques it unconsciously, by exaggerating the obvious characteristics and overlooking the subtle beauties. It is by fair, intelligently produced examples the style should be judged. To avoid invidious reference, we may refer to the "Rembrandts" of such men as Kurtz and Napoleon Sarony, of New York, and Luckhardt, of Vienna, as examples of what we mean.

But in order to estimate the style rightly, it should be borne in mind that it existed long before the questionable name was applied to it, and its greatest master, if not its originator, was O. G. Rejlander. In his compositions, and pictorial studies especially, and frequently in portraiture, he delighted in rendering the bulk of the picture (often including the face) in half shadow, with the smallest possible touch of pure direct light to complete the scale of tones. Mr. Robinson has, from the time of his earliest pictorial photographs, availed himself with great success of the effect produced by faces in shadow, sometimes illuminated by a single touch of sunshine. It is only of late years that the system of producing faces in mezzotint instead of full light has been conventionalized, and, being adopted by some photographers of no artistic culture, the results have at times been offensive just in proportion to the ambition of the attempt. But to the photographer with any knowledge of, and feeling for, art, the practice of producing pictures of this kind is a valuable education, which he would never have attained by remaining in the commonplace groove to which so much of photographic portraiture has belonged. Mastery over lighting is the most important element in the culture of a photographic portraitist; and judgment in applying the various possibilities of lighting to each sitter, so as to secure the best individual result, and avoid general monotony in his work, is of no less importance.

A curious error or misconception appears in one of the discussions at the Edinburgh Society, if we read the report correctly. It was objected that certain effects, in the nature of reflected lights—or, as it is phrased in the report, effects produced by "false reflected light"—were thoroughly untrue to nature. Surely this is a curiously misleading statement. What, it may be asked, is the direct light or the reflected light which alone is true to nature? Every light in which a person may by any chance be placed is, in its degree, true enough to nature. It may be unusual, and hence give the person an unusual, and, by latitude of expression, an unnatural, appearance; but in unusual lighting the question of the aim must be considered, whether it is to secure simple portraiture, or some degree of pictorial effect. If unusual lighting is to be condemned as unnatural, the glorious lighting of Rembrandt must fall under that condemnation, inasmuch as the concentrated light coming through a small high window of a mill—the typical lighting of the master in question—could scarcely be considered either usual or natural. The most usual lighting under which we see our friends is that secured by the narrow side light of a window in an ordinary room, and this would probably most nearly approximate to the lighting adopted in producing the mass of the so-called "Rembrandts." But if it is difficult to affirm that any form of direct lighting is really unnatural, how much more so is it to decide what reflected lights are unnatural or

false? The skilful rendering of reflected lights is one of the greatest charms of pictorial art, and the glorious quality of Rembrandt's work is very much due to them. The mass of most of his pictures is in shadow, but these shadows glow, reflected lights carrying the eye into the deepest gloom. The reflected lights on a figure are produced in degree by every object around it, and are perpetually changing. The only really false reflected lights we have ever seen have been in pictures produced by combination printing, in which figures are printed side by side which, not having been produced side by side in the camera, have not, and cannot have, quite that effect of truth which would have been produced if the minor reflections produced by each on each had been present. Reflected lights being so numerous and varied, there is not much risk of their presence being false or unnatural. The really great drawback we have noticed in many of the "Rembrandts" has been the absence of sufficient reflected lights to make the masses of shadow luminous. The effect of transparency in shadow is only secured by the presence of detail, and this can only be rendered in the shadow by reflected lights; and it is because the crying sin of photography generally, and of this style in particular, is the want of the multitude of reflections which give tenderness and real pictorial value to the presentment, and because of the far too common presence of black, opaque shadows, that we call special attention to what appears a dangerous misconception. The use of reflecting screens undoubtedly requires judgment, as it is possible to give flatness rather than aid in the effect of roundness and relief, by producing awkward reflections; but, judiciously used, we feel assured they may be very valuable, and produce effects neither false nor unnatural.

We so cordially agree with the condemnation which is applied to the excessive retouching by which the effect of stone is substituted for the texture of flesh, and by which all anatomy is worked out of the face, that we are scarcely disposed to dwell particularly on the fact that there is such a thing as legitimate retouching, which neither alters the form nor the texture of life which pure photography has produced. The practice of excessive retouching will probably work its own cure, and the public will grow sick of portraits which look like stuffed dolls or inanities in marble; but it is equally probable that the portraitist who, whilst retaining the texture, form, and general truth of life, ameliorates the exaggerated rendering of freckles, pock-marks, spots, red hair, &c., to which photography so often does less than justice, will always find his art popular. Let it also be remembered that Rejlander, whose aim was to make his art true more than popular, and who is often cited against retouching, was really one of the earliest who applied artistic manipulation to supplement the shortcomings of photography. The modern system of working all life out of a negative he utterly condemned; but no one was his superior in manipulating a negative to improve its pictorial value, by masking, subduing, and combining; and further, by using a pencil of light by which he could literally work as with a crayon on a print which he deemed needed treatment. He felt that appliances of this kind were legitimate enough in trustworthy and capable hands; but of late years he abandoned such aids, in his strong disgust of the falsehood which the modern mode of tampering with negatives had introduced into what he regarded as the art of truth.

A NEW PHOTOGRAPHIC PAPER—BROMIDE OF SILVER FOR PRINTING.

PROF. SCHULTZ-SELLAC communicates to the *Mittheilungen* a very interesting and important article on the use of bromides in albumenized paper, either wholly or in part, as substitutes for chlorides. He says:—

"The chemico-photographic printing process involves the employment of chloride of silver. The principle, known since the commencement of the century, that paper impregnated with chloride of silver, especially in the

presence of an excess of nitrate of silver, becomes darkened by light, first attracted attention on the publication of Talbot's experiments, which were made known at the same time as Daguerre's great discovery. Afterwards the coarser paper surface was replaced by albumen, starch, or collodion films, the colouring in this way being rendered more lively, as in the case of a printing under a varnished surface. Fuming with ammonia has been the most important improvement of this method.

"Since then it has been found that in sensitive papers impregnated with ammonia, the presence of an excess of nitrate of silver is not necessary; that the sensitized paper may be washed, and the chloride of silver film still made to assume a vigorous tint, by allowing it to absorb ammonia. It is known that, moreover, nitrate of silver is sensitive without the presence of chloride of silver upon the paper; in fact, if an albumenized paper is prepared without any salts, the albumen being first of all shaken up with carbonate of silver, it may be sensitized and fumed, and will yield pictures which possess much hardness, and are not, perhaps, vigorous enough. Paper of this kind may even be washed in pure water, and it will still be sensitive. A portion of the nitrate of silver is also retained in an insoluble condition in the albumen film, and in the ordinary process is only dissolved out when it comes into the hyposulphite of soda fixing bath.

"So far as I am aware, it is the chloride of silver which is the essential thing in the silver printing process. I have found that chloride of silver may be *advantageously replaced by bromide of silver*. It is generally assumed that chloride of silver darkens quicker in light than bromide or iodide of silver. If albumenized paper is produced with chlorine, bromine, or iodine salts, and is sensitized and fumed in a similar manner, it will be found that on exposure to daylight under these circumstances, bromide of silver is by far the most sensitive, for it instantly colours and soon becomes blackened, while iodide of silver only assumes a slight tint. Under an ordinary negative the bromide of silver paper prints twice and three times as fast as chloride of silver in the intenser portions of the picture. This greater sensitiveness of bromide of silver paper is especially noticeable in dull daylight; even with a petroleum or gas light, the bromide paper is impressed somewhat, while ordinary chloride paper is not in the least affected. This last property confirms the observations, made with the spectrum, of the different sensitiveness of chloride and bromide of silver.

"In the fumed bromide of silver paper the excess of nitrate of silver performs an important function; sensitized bromide of silver paper—which, by the way, shows a light yellowish tint—must not be washed like chloride of silver paper. Fuming with ammonia is, moreover, absolutely necessary. The bromide picture allows itself to be toned in an alkaline gold bath, and generally assumes a purple tint.

"The bromide of silver film, however, does not assume quite so vigorous a colour as chloride of silver, and does not show, even after long printing, the same metallic surface. In practice, therefore, a mixture of bromine and chlorine salts (say two or three parts of chloride of sodium and one part of bromide of sodium) would be used to mix with the albumen. Such a paper yields excellent and very soft pictures under hard negatives, and is capable of being vigorously printed.

"I believe that a mixture of bromide and chloride of silver is destined to play as important a rôle in positive printing as those salts do in the negative process."

A SUGGESTION.

BY A LITTLE PHOTO.

THERE is a question well worth the attention of the professional photographer which has scarcely yet been sufficiently discussed. That question is, do we take the public enough into our confidence, and cannot some of us, by the

issuing of a few hints as to the capabilities of our art, and also of its shortcomings (if any are admitted), arrive at a better understanding between operator and sitter? Much has been done to elevate the public taste by photography, and, on the other hand, much to degrade it. Is it not time a bolder step were taken in the direction of elevating? Are we not continually being taunted that our pictures are nothing compared with the photographs of the Continent? And is it not in most cases the sitter's fault that such a statement has a foundation in fact? Your average Englishman and woman have an overweening sense of their dignity. They cannot or will not condescend to be a bit easy and natural in a photographic studio; on the other hand, the Continental photographer gets good sitters, for whether it is from the habit of living, as it were, a more public life, or indulging so much in the wicked pastime of dancing, it is certain that it is easier to photograph foreigners than natives; the former are easier posed, and are not afraid of making fools of themselves like your Englishman. It's nice, after you have explained, and posed your sitter, to have the wind taken out of your sails with "Oh! I know I look silly." To hear that has often made the bit of hair that nature and the focussing cloth have left on my head rise in dismay, for where is your expression to come from if that's the idea in the mind? "Am I not stooping too much? Won't my hand come out big? I don't look well side face." These are a few of the troubles of an English photographer even at the present day, not counting the fact that shadow must be introduced but sparingly, and you must be sure and bring out all the lace and jewellery.

A cure is wanted for this state of affairs. I do not write for those who have aristocratic businesses, for of course they don't meet with such sitters; but of the want of taste in our middle class there can be no doubt, and they will dictate to the photographer. On the contrary, Continental people understand good pictures, and have confidence in their photographers. That is what we want to educate our patrons into—having confidence in their photographers.

How is it to be done? One way is, as suggested above, to issue tracts about our art, which has been done already by the American photographers, but rather in some cases in an offensive manner, at least to English ears. Something more comprehensive and polite is wanted.

The best method would be to have local exhibitions of photographs, to which admission should be free. That it would bring the art and its capabilities more before the public, and so induce them to submit more to the photographer's guidance, there can be no question, for they would naturally say: "The men that do these things understand their business." There are difficulties in the way, no doubt, but where there are societies, such as at Liverpool and Manchester, it would be easily managed; and where there are not, let the photographers sink their petty jealousies, and join together, and get them up once or twice a year. A need not be afraid, because B's pictures are better than his, that he will lose trade. Don't let them be personal advertising mediums, but only exhibitions to draw public attention to the art, and elevate taste for good *versus* bad photography. It would run out the quacks in time, and back-slam photography would suffer; but it would raise the art and its professors in public estimation, and raise the social status of photographers immensely.

Even in small towns where two or three are gathered together it could be done, and have some effect in the desired direction; in large towns there ought not to be any difficulty in getting up such exhibitions, if the photographers' so much boasted love of their art is a fact, and not a mere clap-trap cry.

THE ACTION OF SUNLIGHT ON CERTAIN MINERALS.

BY DR. SCHNAUM.*

MANY of our readers will, perhaps, be surprised to learn that the colours of certain minerals are very much in-

* *Photographische Archiv.*

fluenced by the actinic rays. Singularly enough, the action is observed only in the case of the hardest minerals, such as are termed precious stones, and reaches its maximum in the very hardest body known, the diamond. According to the evidence of Dr. Flight, the sensitiveness to light of a coloured diamond is so great that it may be compared with chloride of silver in this particular.

Our ancestors were acquainted with the fact that certain coloured stones and gems bleached gradually in sunlight; for instance, in the beautiful grass-green and opaque chrysopras this is particularly the case. It soon loses the greater part of its beauty on exposure to daylight, and it was a saying among the ancients, that if kept in the dark, enveloped in wine-soaked cloths, it would recover its former beauty. Even the much harder, transparent, dark green emerald is acted upon in time by light, as I myself, unfortunately, am able to testify, for an emerald ring I have carried for seven years proves the fact conclusively.

But it is the diamond that behaves most remarkably in the presence of sunlight. If coloured diamonds are heated, the colour disappears more or less completely and for ever, at any rate in most cases. At times, however, the colour is only changed by heat, and through the influence of the sunlight the original colours are again developed. M. Martin, a noted diamond merchant, once exposed a diamond to a high temperature in order to remove the brownish tint of the same, and he converted the gem into a rose-tinted diamond. M. Caster tried the same experiment with a brown diamond, and this, also, assumed a rosy colour. The most singular thing, however, was, that the colour was only visible in the dark, and in four or five minutes it disappeared—as soon, indeed, as it was exposed to daylight. Then the gems assumed again a light brownish colour. This change took place in a room where, therefore, no bright light could penetrate.

Another diamond, of a dirty yellow colour, was heated to a glow in a porcelain tube with hydrogen, and then allowed to cool; the colour disappeared, but not its brilliancy. As soon as this gem had been exposed to diffused daylight for a period of six or seven minutes its original yellow colour came back again. The experiment was repeated, but this time the diamond was heated in chlorine at a higher temperature; the colour again disappeared, and could not be remarked in the dark; but as soon as it was exposed, even for a few minutes, to daylight, its yellow colour returned.

These phenomena have, no doubt, some relation to phosphorescence, and the difference in coloured diamonds may be compared with the analogous contrasts in character of the phosphorescent properties which different diamonds exhibit after being exposed to powerful light rays.

Correspondence.

DISEASES OF PHOTOGRAPHERS.

SIR,—I have read the sensible and practical comments, in your last week's leader, on a letter of your correspondent "L. L. F.," with great satisfaction. I entirely endorse your remarks, from which any of your readers who may be in doubt will, I trust, derive confidence and comfort. I have been a zealous amateur photographer for upwards of twenty-four years, and having been intimately associated with many amateurs and professionals, have failed to observe any peculiar disease which could be referred to the practice of photography. Dyspepsia, nervousness, and depression are not unfrequent among photographers, but they are not, I apprehend, more common to them than to others where brain work is a chief motive power—such, for instance, as literary men, artists, musicians, &c.

The vapors of ether, alcohol, and acetic acid—the main factors in the dark room—are well known depressants; add to these, ill-ventilated dark rooms, irregular meals,

anxiety to produce first-rate work, pressure of business, and uncertain exercise in the open air, and the wonder is, not that one occasionally falls out of the ranks, but that many are not more or less seriously injured.

Dabbling with bare hands in the toning bath (as I have often witnessed), carelessness in the use of chemicals (such as pyro and cyanide of potash, which latter may be termed prussic acid in the rough) used sometimes on cut or abraded fingers, is not rarely the unsuspected cause of mischief. Of the incautious use of this salt I was, as you know, for two years once the victim, as was also lately that eminent artist, M. Silvy.

I would, then, earnestly say to all photographers, amateur and professional (especially to the latter), let each make it a part of his religion to take a good morning walk before entering his studio—a good brisk walk—filling his lungs with pure fresh air, and as often as possible go into the open air at intervals of his work; take extra care that his dark room be thoroughly ventilated; secure some fixed hour for his meals, with which no engagements should be allowed to interfere; avoid spirituous liquors (which aggravate the action of noxious fumes), overhandling cyanide and pyro, and keep his hands well washed, and out of the toning bath (for, as I once mentioned in your columns, chloride of gold is an energetic poison, and apt to cause ulceration of the skin).

I am not aware of any reason for ever suspecting that photography is a predisposing cause of diabetes, Bright's, or other allied affections; indeed, I know too well that they often arise in cases where the conditions of life are unexceptionally good; and I am only re-iterating your own excellent remarks when I express my full conviction that, when ordinary prudence and intelligence are exercised, there is nothing in the practice of photography likely to be detrimental more than in the pursuit of any other occupation.—I am, sir, your obedient servant,

A PHYSICIAN OF FORTY YEARS' STANDING.

NEW LIGHTS IN PHOTOGRAPHY.

DEAR SIR,—I have lately read a new mode of producing artificial light for photographic purposes, communicated by the ex-President to the Photographic Society. May I ask if there is any difference in the effect or advantage over Moncé's light, which was used with much success in days gone by, and was very economical, although since deposed by the magnesium light? And also, is there any danger of explosion? As a boy I used to make an explosive powder of nitre and sulphur, causing all sorts of mischief in the kitchen (where I experimented), and alarming the neighbourhood,—the only advantage being the cleaning of the chimney, and saving the cost of the sweep.

ENQUIRER.

EQUIVALENT FOCUS OF A PORTRAIT LENS.

SIR,—The following is, I think, a new method that I have discovered for finding the equivalent focus of all lenses used in photography. It is tolerably accurate, and very simple. Go into a room where you have a view through the window of some distant object which stands out prominently, place a table against the wall opposite the window, and on the wall fasten a sheet of smooth white paper. Lay the lens on the table, and slide it to and from the wall until you have an image of the window projected on the sheet of paper. Single out the prominent object, and focus it as accurately as you can on the paper; then measure the distance betwixt the sheet of paper and the end of the lens-tube nearest the sheet; note it down, then measure the distance betwixt the paper and the other end of the lens-tube; note it down also. Reverse the lens-tube so that the back lens now fronts the window; repeat the focusing and measurements as before. There are now four measurements. Add the four measurements together, and divide the total by four: the product will be the equivalent focus

required. The process will be facilitated by unshipping the flange, &c., so that the lens-tube may lay flat on the table.

I. W. DAWSON.

THE PRESIDENT OF THE PHOTOGRAPHIC SOCIETY.

WE have received the following for publication:—

The Hon. Secretary of the Photographic Society of Great Britain presents his compliments to the Editor of the PHOTOGRAPHIC NEWS, and begs to forward to him for publication the enclosed copy of a letter received by him from Mr. James Glaisher:—

1, Dartmouth Place, Blackheath, February 17, 1875.

MY DEAR SIR,—Since the receipt of your letter this morning I have had under thoughtful consideration the acceptance or not of the post to which I have been elected. I have all along believed I had the confidence of the Society; and although I had resolved not again to return to the presidency, still, with such a large vote in my favour, it would seem to be ungracious on my part not to accept the proffered honour. This determination I have arrived at on account of the many wishes expressed by old and valued members, who say that it will be for the good of the Society that I do so. For these reasons I have resolved to accept the presidency of the Photographic Society. At the same time I fear that I cannot promise regular attendance, and I should wish it to be understood that I resume the chair but for a limited period.—I am, dear sir, faithfully yours,

JAMES GLAISHER.

R. J. FRISWELL, Esq., F.C.S., &c., &c., Hon. Sec., *pro tem*.

COST OF PHOTOGRAPHIC EXHIBITIONS.

DEAR SIR,—I am obliged to Mr. Spiller for his practical and official confirmation of my statement relative to the monetary results of the Photographic Society's Exhibition of 1873. It is unnecessary for me to occupy your space with an analysis of the actual income and expenses (which I only professed to give in round numbers), since Mr. Spiller's letter so clearly confirms my remark to the effect that the 1873 Exhibition realized a small profit to the Society, whilst that of 1874 was an actual loss, to an amount between forty and fifty pounds. I did not enter into any remarks on the causes of the loss, but Mr. Fry's letter supplies instructive comment, and shows that the late agitation, besides causing serious disorganisation and discord, has inflicted a serious monetary loss upon the Society.—Faithfully yours,

H. BADEN PRITCHARD.

23rd February.

MANAGEMENT OF BALLOT FOR OFFICERS.

SIR,—I see, by various communications, that some little difference exists in the opinion of members as to the way in which the late ballot of the Photographic Society was conducted. Will you allow me to state that in the many societies to which I have had the pleasure to belong, that I cannot learn that ever the votes given for one office were allowed to be accumulated to add to another. Probably the scrutineers had some precedent which authorized them so to act. I enclose you a balloting paper for the approaching election of officers for the Medical Society of London, as I shall not exercise my privilege. Such paper, being filled up, is enclosed in a sealed envelope; this is placed in another, with name of the sender, and addressed to the President, and it is opened at a council meeting, when, if the member is entitled to vote, the unopened paper is given to the scrutineers. Thus absolute impartiality is secured. Party feelings are occasionally strong at elections, and some years since I remember more balls being taken from a ballot box than there were members present to vote. Of course, it was an accident.—Yours, &c.,

HUGH W. DIAMOND.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Report of the Council.

"For the first time in the history of the Society the Report of the Council does not comprehend a full period of twelve months, inasmuch as the present council and officers were not elected until the 19th of May last, when at a special general meeting a new executive was created by ballot. The record of the past year would, however, be incomplete were we not to commence by referring to the resignation of the president's chair by Mr. Glaisher after six years of active and excellent service to the Society. Our late President has carried with him in his retirement a grateful recognition on the part of the Society of the energy and spirit with which he conducted its affairs during that term of office, and a considerable measure of regret that these services were not continued, especially after having so successfully steered the course of the Society through a period of some difficulty and embarrassment. The thanks of the Society are due to Mr. Glaisher for this estimable service, and will remain recorded in its annals upon that ground.

"Notwithstanding the difficulties inherent to a sudden change in the constitution of the Society and selection of new officers, some good work has been accomplished. Thirteen communications have been read at meetings of the Society during the past year, and the usual exhibition held in October, which was well supported and contributed to by the members, and received favourable notice from the press and general public. Mr. Crawshaw's competition was the means of bringing some additional works under the same roof, and certainly added to the interest of the collection. The exhibition remained open for more than three weeks, and opportunities were afforded for examining the pictures in the evening upon seven occasions, in addition to the private view reserved for members and their friends at the opening soiree on the 13th October. The total number of exhibitors enumerated in the second edition of the catalogue was 87, exclusive of the Crawshaw competitors, and the Society received a considerable accession of new members from this list. The financial aspect of the exhibition will appear in the Treasurer's Balance-sheet.

"The papers read before the Society since April last are as follows:—*'On Printing and Toning Collodio-chloride Paper,'* by George Bruce; *'On the Reproduction of Negatives by the Powder Process,'* by J. B. Obernetter, of Munich; *'Remarks on the Assorted Influence of Colouring Matters on the Reduction of Silver Salts,'* by John Spiller; *'On Collodio-Chloride of Silver Process,'* by George Hooper; *'On the Sensitiveness of the Surface of Tinted Bromide of Silver to the Different Colours of the Spectrum,'* also a *'Note upon Focusing in Spectroscopic Observations,'* by Dr. Van Monckhoven; *'Gelatin as a Vehicle for Silver Salts in the Production of Negatives,'* by Joshua King, M.A.; *'On the Gelatino-bromide Process,'* by R. Kennett; *'A Few Notes on Alkaline Development,'* by Col. H. Stuart Wortley; *'Experience in Taking Direct Life-sized Heads,'* by John Chaffin; *'Away-from-Home Photography,'* by Edward Viles; *'Photographic Experiences in New Zealand,'* by D. L. Mundy; *'On the Nitro-Sulphur Light for Photographic Purposes,'* by John Spiller; *'The Origin, Aim, and Achievements of the Photographic Society, with Suggestions as to its Future Development,'* by George Hooper.

"At a Special General Meeting, held on the 30th June, the designation of the Society was changed, and a revised code of laws passed as those of *'The Photographic Society of Great Britain,'* in accordance with which a general system of ballot will in future govern the election of president, treasurer, and members of council.

"Twenty-five new members have been admitted into the Society during the year, four have retired, and the council mourns the loss of a distinguished colleague in the late Mr. O. G. Rejlander, who died on the 18th ultimo, and in respect of whom an obituary notice is appended.

"Marking the advance of photography at home and abroad, the council notes the establishment of a new society in the West Riding of Yorkshire, and observes, with unmixed satisfaction, the founding of the Belgian Photographic Association. The South London, Manchester, Edinburgh, and other provincial societies, still continue in active operation. Carbon printing has made some technical progress, and the gelatino-bromide and emulsion processes have been certainly advanced a stage. Preliminary lighting, as a means of reducing exposure, has been further studied and applied, and Woodbury printing popularized; but with so many facilities

existing for the publication and discussion of photographic novelties, it is to be regretted that no greater triumphs have been achieved during the past year. It is a source of gratification, however, to report success in the extended scientific use of photography as a means of recording the phases of the transit of Venus, which occurred on the 9th of December. On that occasion one of its most distinguished members, Captain Abney, took an important part. Lord Lindsay, a member of the late council, also fitted out expeditions, which contributed valuable results.

"*Obituary.*—O. G. Rejlander.—On the 18th of January died our eminent colleague, Oscar Gustavus Rejlander, in the sixty-second year of his age. He attended the December meeting of the council, bringing with him an admirable enlarged portrait of his former royal patron, the Prince Consort, finished in monochrome. His health failing fast, he, in a feeling letter to the President, tendered his resignation as a member of the council; and at the last meeting a resolution of condolence, proposed by Dr. Mann and seconded by Mr. England, was conveyed to him in the following terms:—'The council have received Mr. Rejlander's resignation of his seat at their board with very sincere regret, and desire to convey the assurance of their deep sympathy with him in his illness, coupled with the expression of their most cordial regard.'

"By birth the son of an officer in the Swedish army, and by training an art-student from Rome, Rejlander took up the practice of photography, and settled in the town of Wolverhampton, where he produced *'The Two Ways of Life,'* a work of great artistic merit, which gained for him a considerable reputation. Designed for showing the art capabilities of photography, and the possibility of 'combination printing,' the work was sent to the Manchester Exhibition of Art Treasures, and was afterwards shown and fully described by himself at a meeting of this Society, held on the 6th of April, 1858, a full report appearing in the *'Journal.'* Several works of more or less ambitious character, all distinguished for their high artistic excellence, quickly followed, the majority of them being shown at the Society's annual exhibitions, ending with the Album of Studies laid on the table in 1873, and *'Scraps of Expression'* and a portrait of Gustave Doré in 1874.

"A paragraph contained in Mr. Rejlander's communication of 1858 reads now like a prophecy in course of fulfilment, and no apology is required for reproducing it in this place:—'I believe (says Rejlander) a time will come, and that not far distant, when *real art* and photography will go hand in hand, the latter as a means to the artistic end. It cannot be otherwise: photography is but 'the holding of a mirror up to Nature;' and the more thoroughly a mind is imbued with the love for, and a discernment of, the *true* in art, the oftener will it plume and refresh itself at the fountain of its inspiration, and draw from its ample, but to many hidden, treasures.'

"For several years past Rejlander resided in London, where he died, and having been a member of the 38th Middlesex (Artists') Rifle Volunteer Corps, was buried with military honours at the Kensal Green Cemetery, in the presence of several members of this Society, and many friends who mourn his loss."

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE second popular meeting of the session was held in Queen Street Hall, on the evening of Wednesday, the 17th inst., when there was, as usual, a very large attendance.

The exhibition consisted of a series of pictures illustrating a tour through the North and West Highlands, and were the joint productions of Mr. Wilson of Aberdeen, Mr. Valentine of Dundee, Mr. Davies, and several of the members who made the tour.

THE PRESIDENT (Dr. Thompson), in introducing the lecturer, Mr. W. H. Davies, said that he thought it right to take the opportunity, when so many of the friends of the Society were present, to call general attention to the work which the Society was doing. In addition to the ordinary meetings held for the purpose of reading papers on photography and kindred subjects, and carrying on discussions from which much mutual benefit was derived, there were during the summer a series of most delightful out-door meetings, when, cameras in hand, the members roamed over hill and dale in search of the picturesque and the beautiful; and although they might not always be able to secure all they could wish in that line, they never failed to get fresh air, necessary exercise, and most genial social companionship; and, as a natural consequence, good health and much happiness. Those two branches of the Society's operations were carried on at comparatively little cost; but it was different with the third, and certainly not the least

valuable, part of the work in which the Society was engaged—he alluded to the popular meetings, of which the present was an example. The “popular evenings” of the Edinburgh Photographic Society had, he said, become an institution in the city. They from time to time gave gratuitously to many hundreds of the inhabitants an opportunity of seeing some of the finest productions of the camera, in our own or other countries; and by means of the generally interesting lectures which accompanied those exhibitions, they were also afforded a large quantity of valuable information. Those popular meetings, it would be very evident, cost a good deal of money, and the Society looked to the public to assist in finding the necessary funds. The public hitherto had responded very well, as would be understood from the fact that they had probably two hundred of what he might call non-photographic members; but still there was room for a few hundreds more; and as the subscription was only five shillings per annum, he hoped that the Secretary would have many applications from gentlemen, and ladies too, who were willing to submit themselves to the ordeal of the ballot-box.

Mr. DAVIES then proceeded with his lecture, in which he stated that, along with several of the members of the Society, he resolved to spend a few days in the North and West Highlands, for the double purpose of shaking the city dust out of their brains, and getting material for a popular evening. They left Edinburgh by an early train, arriving in Greenock at nine o'clock, in time to catch the *Iona* (that prince of Scottish steamers), which quickly and pleasantly carried them down the Clyde to Rothesay, and through the far-famed Kyles of Bute to Ardrishaig. Instead of following the usual or royal route to Oban, they then diverged to Loch Awe, up which they sailed in the smallest of small steamers, capable of dining only some eight at a time, and they were seventeen. After a day or two of rest and work, they next passed through Glencoe to Fort William and Corpach, in the enjoyment of Highland air and “mountain dew,” and so well pleased do they seem to have been with the latter part of the enjoyment, that, out of gratitude, they unanimously carried Ben Nevis as an honorary member of the Society, thus proving them to have been a set of “tight’uns” (Titans). From Corpach their route lay through the Caledonian Canal to the famous Falls of Foyers, and thence to Inverness. In the Highland capital they enjoyed themselves much, and secured some good pictures, and proceeded through Calloeden Moor to Aberdeen. They were not fortunate enough to find Mr. G. W. Wilson at home, but made the best of their time in visiting some of the largest granite works in the world, and then started for Balmoral. Here, of course, they wanted to try their plates; but, having omitted to get the necessary order, they were somewhat afraid that a difficulty might occur with the old woman who kept the gate at which they wished to enter. A judicious expenditure of flattery and whiskey, however, proved an “open sesame,” and all went so far well. They afterwards discovered that there was no necessity for even the expenditure mentioned, as any ordinary piece of writing would have answered the purpose, the old lady being perfectly innocent of a knowledge of the art of caligraphy. They then proceeded to Braemar, in expectation of being present at the annual “gathering” which has made that place famous, but found that they were just too late by a week, and had to content themselves with a picture of it, which was shown on the screen. Here some pleasant days were spent, and some excellent pictures secured. The return home was through the heart of the Grampians by the passes of Cluny and Glenshee, the first halt being made at Blairgowrie. Here there was neither time nor opportunity for photographic work, but the loss was fully compensated for by a visit to see the national drama of “Cromwell” performed in the Theatre Royal, a canvas erection, which, if not quite up to the usual mark, had at least the great qualification of being thoroughly ventilated, and where they saw the company feasting on a real sheep’s head, at the low charge—not for a share of the feast, but for permission to the boxes—of three pence each. From Blairgowrie they found their way to Bonnie Dundee, where some pictures were also obtained, and thence through the kingdom of Fife back once more to Auld Reekie, very much delighted with the tour.

The pictures were unusually fine, and elicited the almost continuous applause of the large audience.

On the motion of Mr. Dobbie, a hearty vote of thanks was given to Mr. Davies, and also to Messrs. Wilson and Valentine for their share of the pictures exhibited.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held at the Victoria Hotel, Bradford, on the evening of Monday, the 1st inst., Mr. J. W. GOUGH, President, in the chair. There was a numerous attendance of members.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected as members:—Messrs. J. Bottomley, J. Beldon, W. M. Arundale, and A. Coe, Bradford; Mr. S. S. Priestley, Huddersfield; Messrs. Wm. Huggon and G. A. Huggon, Leeds; Messrs. Wade, J. Whiteley, and H. Edmunds, Halifax; and Mr. Catford, Ilfracombe.

The rule announced for discussion—namely, as to the propriety of the Society’s holding exhibitions and offering prizes for competition—then came under notice.

Mr. SMITH (Halifax) suggested that the words “the Society shall offer prizes” be altered to “the Society may offer prizes.”

This proposition met with general approval, and on the President putting the rule in its amended form, it was unanimously carried.

Mr. J. HOWARTH then read a paper on “Warming Studios” and laid on the table a large diagram of his heating apparatus which was inspected by the members with great interest.

Mr. WHITELEY stated that he had much pleasure in testifying to the efficacy of the stove and its great heating power, as he had had one in operation for some time.

In reply to a question by a member,

Mr. HOWARTH said that his apparatus might be fitted up at a cost (roughly estimated) of about three guineas.

A communication, for members’ use only, from Mr. W. H. Brunton, Whitehaven, “On the Acceleration of Exposures,” was then read by the Secretary.

On the motion of Mr. Smith, a vote of thanks was unanimously accorded to the gentlemen who had contributed papers.

Mr. GREAVES having kindly consented to demonstrate the development of carbon prints at the next meeting, the proceedings terminated.

Talk in the Studio.

FUMING ALBUMENIZED PAPER.—A correspondent who has had considerable trouble in obtaining rich, brilliant prints from fine, but somewhat thin negatives, having adopted our advice to try fuming, has been singularly successful, his prints at once becoming rich and vigorous, as well as delicate. He says:—“I write to thank you for your suggestion (which has in my case proved most valuable) that I should fume my sensitized paper, and to let you know the result. Without having doctored or strengthened my silver solution (which I have always carefully kept *neutral*), or without having intensified my negatives, I can now get satisfactory prints by adopting the fuming with ammonia. I tried the experiment without much hope, but was perfectly amazed at the almost magical effect which the ammonia had produced. Instead of the disagreeable foxy red which has always hitherto appeared in the printing-frame, I now get an indescribably rich purple; the prints appearing bright blue in the early stages of printing, and gradually changing to purple; the shadows bronzing much more than is the case with paper not fumed. The toning and fixing also now proceed much more satisfactorily; but in the first operation it is somewhat more difficult to judge the right length of toning, because the prints are of so fine a colour before entering the toning bath that they appear more toned than is really the case.”

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.—The next meeting of the above Society will be held on the 1st of March, at 7:30 p.m., at the Victoria Hotel, Bradford.

ART UNION OF THE PHOTOGRAPHERS’ BENEVOLENT ASSOCIATION.—A circular has been issued by the Association in explanation of the postponement of drawing. It seems that some misunderstanding of the reply to an application made to the Board of Trade for permission has arisen, and after handbills and tickets had been issued, and the co-operation of agents solicited, nearly 3,000 tickets having been sold, and the proceeds paid into the London and County Bank, to the credit of the Photographers’ Benevolent Association, “at the last moment the Secretary received a letter threatening proceedings from a

• This paper will appear in our next. The copy of the diagram did not reach us in time for insertion in this number.

solicitor, instructed either by an informer or by a rival art union. On the receipt of this letter, legal advice was obtained, and under that advice the drawing was postponed. Steps are now being taken to obtain a Royal Charter. In the meantime the Board of Management ask the indulgence of ticket holders, with the assurance that the drawing shall proceed as soon as possible, due notice of which will be given by advertisement in the *PHOTOGRAPHIC NEWS* and *British Journal of Photography* and by circular to agents. The Secretary also begs to state that the agents are not to blame for having sold the tickets, as they, of course, took it for granted that there would be no hitch in the proceedings, and they were desirous of aiding a benevolent scheme. Ticket holders who object to wait a short time for the necessary preliminaries in obtaining a charter will have their money returned by the Secretary on receipt of tickets. In conclusion, the Secretary tenders his sincere apology to agents who have been inconvenienced by their share in the sale of tickets, and trusts that the explanation (which could not be issued earlier for certain reasons) will be sufficient to exonerate them with their ticket holders."

BLEACHED SHELLAC.—To produce good white lac, proceed as follows:—Dissolve in alcohol a quantity of orange shellac; to this add bone-dust (ground very fine) until you have a thin paste. This mixture allow to stand several days exposed to the full action of direct sunlight, shaking repeatedly and thoroughly all the time. When the shellac solution appears bleached enough, filter into a bottle through a paper filter the liquid portion. If it does not filter clear the first time, pass it through again.—*Western Photographic News.*

To Correspondents.

ONE WHOSE AMBITION IS TO EXCEL.—So far as we can judge from the plate received, the coating of gelatine is scarcely thick enough, and the exposure has been insufficient to produce a well-defined impression. But you must be prepared, in undertaking a new trade, to meet with many difficulties, which must be worked through by personal effort and patience. The business of a lithographic printer generally requires an apprenticeship, and photo-collagraphic printing requires much of the same skill, with much superadded. When you have got a perfect plate, the task of "inking up," to get it into a satisfactory working condition, requires much skill and patience, alternate sponging with water, and inking with the roller many times, being required before the plate is in a condition to print satisfactorily. The ink used is lithographic ink, not ordinary printers' ink. We have given recipes for the preparation of the ink several times. A lithographic roller made of leather, or one covered with india-rubber, is used.

J. W. DAWSON.—The best lens for a pocket apparatus would be a single stereoscopic lens, which would, of course, produce a picture three or four inches square very perfectly. 2. Such a lens may be obtained for the price you name. 3. Any good dry plates will answer for the purpose. If you are familiar with the working of bromo-gelatin plates, they will answer well.

J. C. B. (Sydney).—We have not had much personal experience of the printing of copies of engravings in line in carbon; but we can readily conceive that, under some circumstances, the difficulty you mention might be experienced, as there is less material to hold together than in the case of a continuous tint. One mode of reducing the difficulty would be, for such subjects, to adopt the single transfer system. Another would be to give the glass plate a preliminary coating of india-rubber, and in transferring allow this film to leave the glass and remain as a permanent coating to the print. It is very likely that a tissue specially prepared would answer best for your dry climate; an extra proportion of sugar, or a trace of glycerine, would probably make it tougher and more suitable than the tissue prepared for the humid climate of England.

BEDFORD, LEMERE, AND CO.—The small yellowish white spots on prints may proceed from various causes, not always easy to trace, especially so when the complete history of the case is unknown. The presence of impurities in the mounting board or mounting paper will cause such spots, as will also the fermentation of the paste, &c., used for mounting. Minute bubbles forming on the surface of the print whilst in the hypo, preventing perfect fixation, will cause such spots, and these do not always become manifest until some time afterwards. Sometimes imperfection in the albumenised paper will cause such spots, especially if it be old and have been kept in a damp place. Contact with bronze powder used for "gold" printing will cause such spots.

WILHELM.—The best plan will be to communicate with M. Ernest Leclair de la Photographie, 21, Avenue de la République, Paris. You can write to him in English. We

W. B. P. G.—As a rule, equal proportions of ether and alcohol answer well for diluting collodion for ordinary purposes. For large plates it is well—especially in hot weather—to use a larger proportion of alcohol, the exact proportion being governed by the condition of the collodion and the heat of the weather.

APRO.—A good half-plate negative will answer very well for enlarging purposes. The extent of enlargement depends on the distance of the lens from the subject, and the distance of the sensitive plate from the lens. If, for instance, you wish to enlarge the original six times, with a lens eight inches focus, the camera must extend to allow fifty-six inches between the lens and ground glass, and the distance between the lens and object ten inches.

C. R.—We do not know any medical man in London who has given especial attention to the diseases of photographers; indeed, as we stated, all to whom we have ever mentioned the subject have ignored the idea of any such special tendency existing. See a letter in the present number. Dr. George Johnson, of 11, Saville Row, has made the study of Bright's disease a speciality, and diseases of the kidneys generally, we believe. We shall have pleasure in receiving details of the experiments you mention.

F. W. REYNOLDS.—We are glad that you find that fuming meets your difficulty. The print you send is certainly very fine indeed. With fuming it is manifest that your negatives are just right. The probable reason that fuming is so comparatively little practised in this country arises out of the character of the negatives produced. As a rule, the negatives are intense and brilliant enough to give vigorous prints by the ordinary modes of printing prevailing. Fuming renders the paper more sensitive, and secures more rich and vigorous prints. It is therefore especially valuable with a certain class of negatives. With the same paper unfumed, and a negative which permitted very deep printing in the shadows without becoming too deep in the lights, you would also secure vigorous prints. But, as a general rule, we recommend fuming as possessing many advantages. The paper in question is probably somewhat acid from the use of albumen in a state of fermentation.

T. J. A.—With the space at your disposal—that is, thirty feet from north to south, and fourteen feet from east to west—you may secure good lighting. The building will be, of course, a ridge-roof, and you will have glass on both sides. As a rule, it is probable you will find the light from the east side suit your purpose best; but you can change it at your convenience. By placing the background across the corner of the room, and inclining the sitters to the north, you can obtain a good deal of north light.

L. L.—We cannot with propriety enter into a comparison of the various lenses by name in this column. We have never seen flare produced by the lens you name, and it is one which would be well suited to the purpose you name. The old-fashioned lenses you name will give good definition over a limited area; but none of them will give good definition with a very wide angle. 2. Much depends on the subjects. If you wish to take merely the head and bust for enlargement, a good portrait lens of the old form will answer well; but if you require definition over a portion of the figure, then one of the modern lenses with flatter field will answer better.

B. P.—We should regard the process as better suited to a popular taste easily pleased with a pretty picture than to a cultivated taste with a true feeling for art. At best, the result would not be a specimen of good art. Water colours are used; the coloured varnishes are probably a French preparation. We do not know them. 2. The pigments used for retouching a carbon print in monochrome must necessarily vary with the tone of the print, and the manufacturers of the tissue must of necessity have an advantage in using precisely the same pigments. As the artists they engage are probably constantly employed upon the work, they gain experience, which will enable them to excel; so that even if your skill be equal, your results might naturally be somewhat inferior. We do not see how we can help you in such a matter.

IXON.—You do not state any particulars as to the size of studio. A good general plan would be a studio with ridge-roof, 26 feet long, 10 wide, 13 feet at ridge, 7 feet at eaves. North side and roof glass, except 6 feet at each end. Both ends opaque. South side and roof 8 or 9 feet opaque at each end, rest glass. Side lights coming to within about 20 inches of the floor.

G. W. P.—Each possesses merits, but we should prefer No. 5.

M. D., in a kind and complimentary letter, confirms our remarks on the diseases of photographers. He mentions that diabetes is not, properly speaking, a disease of the kidneys. We are aware that it is considered by many really a disease of the nervous system; but whilst it involves the whole system, it is commonly regarded as especially connected with the kidneys, as its special manifestation is found in the discharge of sugar by these organs. M. D. also mentions that *albuminuria*, or discharge of albumen by the kidneys, may sometimes be a temporary symptom, and does not alone necessarily imply the existence of Bright's disease. Nothing, he adds, has a more detrimental effect on the health of a valetudinarian than the habit of self-watching and search for special symptoms.

Several Correspondents in our next.

The Photographic News, March 5, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

A PHOTOGRAPHIC VOCABULARY—THE BELGIAN PHOTOGRAPHIC ASSOCIATION—A NOVEL PHOTOGRAPHIC ESTABLISHMENT.

A Photographic Vocabulary.—It would be a good thing if we could re-model our photographic vocabulary to some extent. Take the words positive and negative, for instance: they are capital words in their way, but, unfortunately, they do not at times mean exactly what we want to express, and then we are driven to employ such names as cliché, transparency, diapositive, and all sorts of expressions. It would be well, indeed, if we had the word cliché in our language, or followed the French example of having something in our vocabulary which means a transparency only, such as yields an impression by printing through, whether the result be positive or negative. We have now to employ positive clichés so often, for one process or another, that their production is at present very widespread; and, in referring to them, one is often tempted to call them positive-negatives at the moment, to distinguish them from ordinary negatives. Again, we are given to talking about reversed negatives and reversed positives, which seems something of a contradiction at first sight, although a photographer, of course, knows well enough what is meant by the terms. In describing our manipulations, too, we are sometimes puzzled how to render matters clearly; how to distinguish between the silver bath for dipping plates, and the silver bath for exciting paper; and how to name the dark slide and shutter correctly. Again, in lenses, we call the whole combination of glasses a lens; and when it is directed to unscrew the back or front of a lens, the pupil is just as likely to err in the matter as not; whereas, if we had a distinctive name for the separate lenses, in the same way, pretty well, as in microscopes, &c., calling the glass nearest the object the object-glass, and that one nearest the eye the eye-piece, no difficulty whatever could arise in the matter. It is the same in giving directions about wet and dry collodion plates: one never knows whether, for instance, plate signifies the glass and sensitive film together, or the glass alone; and it is often necessary to read through the context of a paper to be able to form an opinion. One of these days, perhaps, we may have a dictionary of photographic terms which will set all these doubtful matters at rest for us.

The Belgian Photographic Association.—The new Belgian Photographic Association has begun life vigorously enough, and we sincerely trust it may continue its energetic measures for many a year to come. Its *Bulletin*, which is issued monthly, is quite a budget in its way, Professor G. de Vylder, Professor of Photography at the Ghent Industrial College, who is the president of the Association, being evidently its chief supporter. Some capital original papers have already appeared, as our readers are aware; for we have deemed them important enough to translate and reprint in full in these columns. Besides these communications, one special feature of the new journal is to give full abstracts from all the principal photographic journals of the day—French, German, Italian, and English—as they appear, giving a digest of each number as it comes out. As we have, too, already acquainted our readers, the Belgian Association propose to organise an exhibition this summer in Brussels, under the patronage of the King, of which M. Rommelaere will be secretary. This gentleman, we may mention by the way, is just now engaged in the translation of Captain Abney's excellent handbook of photography, which will, we believe, be brought out under the auspices of the Belgian Association; and this fact we mention with some pleasure, as it shows the esteem in which one of the most skilled and scientific photographers

in this country is held by our French-speaking neighbours. Respecting the exhibition, which opens in July next, our readers have already learnt something; but we may repeat, for the information of those who may not have seen the announcement in our columns a fortnight ago, that the address of the secretary at Brussels is 44, Rue de Namur, and that applications for space should not be made by intending exhibitors later than the 1st May.

A Novel Photographic Establishment.—News comes from San Francisco of a very original kind of photographic gallery which is destined to float down the whole course of the Mississippi. It is named, after its owner, the "Doremus Floating Photographic Gallery," and it is, seemingly, one of the boldest speculations that has ever floated. About eighteen feet broad by seventy-six feet long, it appears a veritable Noah's ark, and it contains, besides reception rooms for visitors, studio, and dark room, three bedrooms, kitchen, stove, &c. It is Mr. Doremus' idea to float slowly down the monarch of rivers as far as the Gulf, and to stop awhile at every interesting spot where mighty views of the scenery will be secured, while at the same time any inhabitants of the neighbourhood, if they so desire it, will be at liberty to have their portraits taken on board. The proprietor estimates that the journey from the source to the outflow will take him something like five years, and during this period he hopes to secure a fine collection of scenes of the Mississippi and its neighbourhood, such as will constitute a grand record of the mighty river. The cost of the entire craft and fitting has been estimated at three thousand dollars, so that a large return is necessary to cover the preliminary cost of the enterprise. We hope that Mr. Doremus' speculation may turn out a remunerative one, but we should suggest operating as little as possible on board ship, for with the best mooring available, it is almost impossible to avoid shaking of the apparatus or model on a floating structure.

THE PRACTICAL PRINTER IN AMERICA.

XIX.

CUTTING AND MOUNTING.

THERE is no part of photographic printing that is more difficult, or shows more the taste, skill, and worth of a photographic printer, than this simple (?) process (as it is called by some) of "cutting the prints." Many have been the prints that have been ruined in the trimming, that were otherwise good. What would be the value of a print that was brilliant and most beautifully toned if it had been ruined in cutting?

I have often been surprised that prints, which are so beautiful in other respects, should be so abominably cut out as some have been that I have seen, when, at a glance at the prints, we could see that, with this exception, the printer thoroughly understood his business, for even upon the closest examination of it, before it was even burnished, we could not see either weakness or coarseness of the paper in the slightest degree, too much bronzing in the shadows, lack of brilliancy, printed neither too dark nor too light, toned so finely that we cannot criticise it a particle, and, in fact, the whole print was a perfect gem, with this exception.

We will pause here a moment and consider. Undoubtedly all of those parts of this print which show workmanship were done by a workman—an excellent one, too, at that—whereas the trimming, which certainly does not show workmanship, was most probably not done by a workman, but by one who was not well learned; most probably by a boy, or a very careless assistant printer.

It has very often been said, and I myself have heard the expression several times, that "any one can trim prints who has been in a printing-room two days;" and I must here beg leave to differ, for, on the contrary, it takes years instead of days to trim them as they should be; and

it is owing to the belief of many photographers in the quotation I have above cited that the almost inexperienced help is told to trim the prints (so as to keep them busy, you know!), while the foreman printer and his experienced assistants are printing, &c., with only this advice (and often not that), "to be sure and have the nose or mouth come in the centre of the print." This part of the work should be entrusted only to an experienced person with a correct eye and good judgment as to the effect required in the finished picture.

In the cutting of the prints there are a variety of rules to be observed which tend towards the prints being properly cut, and, although it is in some cases almost utterly impossible to give rules that will reach them, not knowing the style, &c., of the prints, as almost every operator poses differently, yet a very great number of cases can be hit by the rules which will be given below.

The implements, &c., that are used in cutting the prints are:—One large plate glass, 10 by 12 inches in size, for cutting the print upon, and in case you cannot obtain a plate glass, a thick, level, ordinary glass of the same size will answer; one whetstone; one Robinson's photograph trimmer;* one pair of large shears; one shoemaker's knife; one glass, size $7\frac{1}{2}$ by $9\frac{1}{2}$ inches, for cutting 8 by 10 prints; two 4-4 glasses, one $6\frac{1}{2}$ by $8\frac{1}{2}$ inches (for ordinary 4-4 mounts), and one 6 by 8 inches (for prints that are to be mounted on lithographic mounts); one oval 4-4 brass mat guide, size of opening $5\frac{1}{2}$ by $7\frac{1}{2}$ inches; two imperial size glasses, one 4 by $5\frac{1}{2}$ inches, which is the size generally used, and one $4\frac{1}{2}$ by 6 inches, which is used when an imperial glass is wanted a little larger for special cases; one cabinet glass, size $2\frac{1}{2}$ by $4\frac{1}{2}$ inches; two cartes-de-visite glasses, size $2\frac{1}{2}$ by $3\frac{1}{2}$ inches, which is the ordinary size, and one $2\frac{1}{2}$ by $3\frac{1}{2}$ inches, which is made larger for the same reason as the imperial. When the latter class is used the prints should have been printed upon large card pieces, as the pieces that are obtained, as has been shown on a previous page, are a trifle small for the last-named glass. If printers wish to obtain a great number of small card pieces from a sheet of paper, they will then have to have their card-glasses shorter.

Have places for these things, and always keep them in their places, except, of course, when in use. Prints larger than 8 by 10 inches are very seldom cut, either before finishing or after, for they are mounted upon plain "No. 1 Extra" card board, size of said cardboard varying according to the intended size of the prints, and covered with either oval, square, or arch-top mats, and framed with the mats placed next to them.

Although these large prints are not cut to any particular size before toning, they are trimmed, and their edges cut cleanly, so that they will not be so likely to tear in the water during the future operations which they are destined to go through. In many galleries the 4-4 prints are not cut to any particular size, but trimmed as the larger prints are, and mats are also placed over them when they are about to be framed.

Considerable saving can be made as regards the expense of a mat every time a print is framed, if the prints are cut to the exact size and style before toning, as is the case in regard to the common carte. For instance, if you were to cut your 4-4 prints either oval or square before toning, the prints could then be mounted upon your 4-4 cardboard which was prepared for it, and, as will be shown, you can save considerable money in the course of a year or two by so doing, of course, in a greater or less degree, according to the amount of business the photographer has. To do this, however, it is necessary to have mounts prepared especially for the purpose, for if the prints were mounted upon the plain cardboard, and no mat placed over them when framed, the effect would not be at all pleasing.

(To be continued.)

WARMING STUDIOS.

BY JOHN HOWARTH.*

FROM what little experience I have had in the practice of photography I have found that the want of a proper system of warming and ventilating studios is seriously felt. My purpose in this paper is to point out what I believe to be the best means of accomplishing that most desirable object—a studio properly warmed and properly ventilated. Every part of the room should be equal, or nearly equal, in temperature; all the air in the room should be constantly changed; and the foul air and deleterious gases, always generated in such structures, should be got rid of as they are formed, and give place to a constant supply of fresh, pure air.

There are three modes of warming studios usually adopted, to all of which, on various grounds, I strongly object. I purpose now to point out a plan which will be found to be better, cleaner, healthier, and cheaper than any or the best of the three.

The Open Fireplace System.—This is objectionable in a studio on account of its not acting uniformly all over the room; although by stopping up all crevices for the inlet of cold air you can raise the room to a considerable temperature, yet the heat is oppressive and unhealthy on account of the foul air not being replaced by fresh oxygenised air. In addition to this, the fresh air which enters in any case to supply the fire being colder and heavier than the air already in the room lies at the bottom in a distinct stratum, and as it becomes heated near the fire passes away up the chimney, taking with it the greater part of the heat from the fire, thereby causing great waste of fuel. Cold draughts, smoke, and the photographer's great enemy, dust, always attends the open-fire system.

The Close Stove System.—In a studio warmed by a close stove there are neither draughts nor smoke, and comparatively little dust, therefore several of the disadvantages of an open fire are obviated. There is, however, one disadvantage under which it labours which is of great importance, viz., that only a small quantity of the air reaches the stove, and, being usually made of cast iron, the heated surface acts very injuriously upon that portion of the air which comes in contact with it, rendering it unfit for breathing, and frequently causing headaches and other unpleasant sensations owing to the large quantity of carbonic oxide and sulphurous gases given off by all heated cast-iron surfaces in contact with fire.

The third system—that of hot water circulating through pipes—is used to a certain extent, and, although less objectionable on many grounds than the other two, it has its disadvantages. The principal of these are, the great bulk of the apparatus, the expense of fixing, the chances of water freezing and bursting pipes, the constant liability of leaking from the pipes, joints, &c., and the great length of time required to keep the fire going before any effect of warmth is produced, and consequent loss of fuel. On this point I may say that I have the best authority for stating that only half the heat of combustion is applied to use by any mode of warming by water.

The system to which I will now call your attention as the one I adopt is, in my opinion, the best adapted to the wants of the photographer of any hitherto used. The introduction of the George's calorigen—with which all readers of the photographic journals will be familiar—is a step in the right direction, but falls very far short of realising the full capabilities of the system.

I may here tell you that warming rooms to very high temperatures has been my closest study for the last twelve years. The result of that experience has been the production of a stove for small rooms, and of a furnace and apparatus for large rooms and public buildings, which embody all that can be done in securing the advantages to be

* Supplied in this country by Mr. Woodbury.—Ed.

* Read before the West Riding of Yorkshire Photographic Society.

derived from an abundant supply of fresh, pure air, with the benefit of utilising the heat of combustion to its fullest extent, in their application to warming and ventilating purposes.

I was led to the idea of their suitability for warming studios from having, some time ago, come into possession of a gallery of my own. Putting in one of my stoves I have had the benefit of experience in its use ever since, and I would not now like to be without it. I believe that an abundance of pure, dry air is what the photographer most requires for every part of his premises, and that it would be found to be better for his health, better for his comfort and pleasure, and better for his business. If he take up his cloth or leather to wipe his glass previous to coating a negative, what is more disagreeable than to find it almost saturated with moisture? The glasses themselves, if cleaned some time beforehand, are found to be coated with a film of moisture, which is a prolific source of streaks, and the films slip off in washing under the tap. All these annoyances disappear like magic under the influence of warm, dry air. The cloths are found crisp and dry, and, if the glass for the negative be held for a moment over the stove just previous to coating, there will be no such thing as the film dancing off the plate, or even of driving it off with reasonable usage.

In speaking of dry air, I do not mean that the air is absolutely dry, but that there is no visible moisture in the room, air having the property of taking moisture in proportion as it increases in temperature. Thus, at a low temperature, this capacity is very small, but it is rapidly increased as the temperature is elevated. Then any dampness or moisture ceases to be visible, and the warmed air (for instance, a sponge with water) takes up the moisture and holds it in solution. You can test this by taking a tumbler of cold liquid or a looking-glass into a room heated up to two or three hundred degrees with what you suppose to be dry air, and you will find the cold surface immediately covered with a film of moisture. However, if at any time the air be thought to be too dry it can easily be altered by placing water in a receptacle prepared for it in the stove, or by fixing a small fountain of spray inside a glass vessel in a convenient part of the room or studio. The effect would be both ornamental and very refreshing and agreeable when the room was warm.

An arrangement can be easily fitted at the top of the stove to receive wet negatives as they are made, where they will dry without trouble or care, and keep warm ready for varnishing at any convenient opportunity. The operator will find it the quickest, cleanest, and least troublesome means of varnishing he can possibly employ. Another advantage is that it is the most efficient ventilator, both for winter use with fire, and for summer use without fire. If the cold air to supply the stove be taken from a cellar or other cool place it will aid very materially in modifying the high temperature which usually exists in all glass structures in hot weather. There is no difficulty in keeping baths, chemicals, and everything in order, as you can have a summer temperature, with a full supply of fresh air, all the year round.

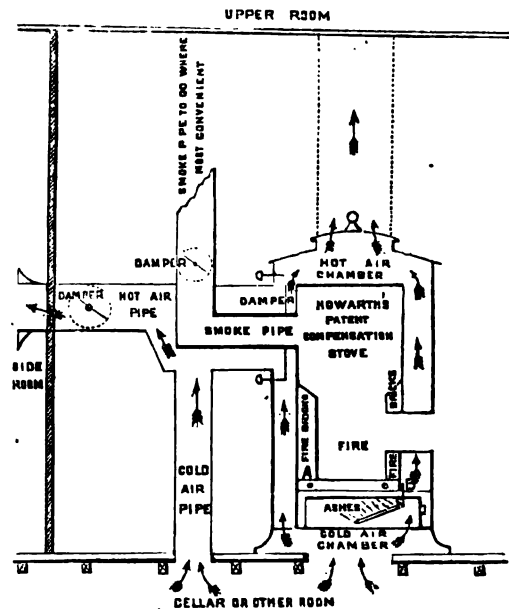
I know it has been the custom for many years to cry down heated air as an objectionable mode of warming rooms, but I have found that the various theories put forth do not hold good in practice. The evils complained of do not apply to air which is constantly changed in the process of heating, but only when the same air is heated over and over again. I have often proved that air can be raised to very high temperatures without being vitiated. I have seen hundreds of instances of persons suffering from congestion of the lungs, and other disorders of the respiratory organs, relieved at once on entering a room warmed in this manner. I claim this as a point of superiority over every other form of stove—that, however hot it may be in the room, ventilation goes on in the same ratio. The hotter the stove the quicker the admission of pure air, and, however

warm the room may be (and I have often tested it at very high temperatures), there is no feeling of oppressiveness through the want of purity of the air. This result is mainly attributable to the mode in which the heat is applied. I leave all stoves made either wholly or in part of cast iron out of the question entirely, as it is only from a surface of best wrought iron that good results can be got; and I hold that no system of warming can be correct that does not secure a regular and uniform change of the entire contents of the room from the top to the bottom at regular intervals.

Taking the calorigen as the best stove in the market, I assume the points of difference to be greatly in my favour. First, I can warm a much larger area with the same quantity of fuel. Second, the air is in greater volume and purer. Third, where the conditions of the structure of the building will admit of it, I can warm two or three rooms as easily as one, and from the same stove. Fourth (which is of paramount importance), it will not cost above half the price.

In reference to the first and second of these points, I may say that the passage for air is much too contracted in the calorigen stove, and has to strike too many points of heated surface before it can discharge itself into the room. If you take a sketch of that stove, you will see that the air passage is formed of a pipe which, after passing perpendicularly through the fire, is made into a double coil, the end of which is terminated at the top of the stove. Now the air in its passage through this coiled pipe is compelled to strike so many points of heated surface that it must of necessity become superheated, and consequently, to some extent, vitiated. My stove is made as far as possible on the principle that air should only strike the heated surface once, and then come off into the room; and, as I have before pointed out, the effect of the stove becoming very hot is not to vitiate the air, but to make it move quicker, and so warm the rooms sooner.

It is common in all close stoves for the ashes and clinkers to choke up the grate bars, and the fire has to be put out to enable it to be cleaned. In order to overcome this difficulty, I have put in a grate with an arrangement by which half the bars can either be drawn out, or one end let down into the ashes drawer, the other end working on



a pivot A. Thus every alternate bar being away, you can insert an instrument between the other bars and let down the dead fire into the ashes drawer. The loose bars being

now replaced, and held in position by the catch B, the fire can be replenished, and all goes on as usual.

Another important feature is, that as soon as the fire is lighted the heat begins to come off, and in an incredibly short time the change is felt by an increase of temperature all over the room. When it is warm enough you can regulate the fire to make it burn quickly or slowly at pleasure, so that once set going properly it requires very little attention. I have frequently had a fire in a small stove with no more fuel than you could hold in your hands, which kept lighted from eight to ten hours at a time. So long as any heat remains in the stove, even after the fire has died out, you still continue to get the benefit of it.

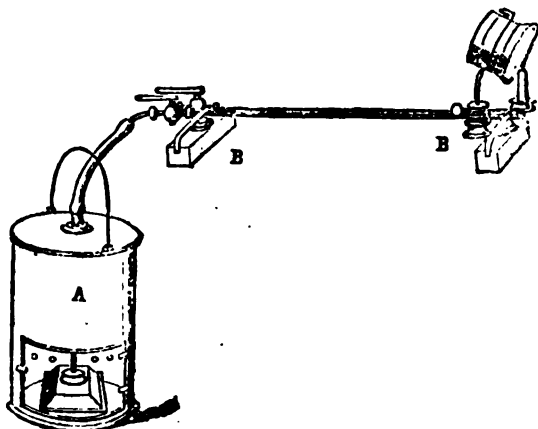
It is a great advantage, also, that these stoves, whether of wrought iron or bricks and iron, can be placed in any out-of-the-way corner of the studio itself, in a small room adjoining, or in a room underneath, and still have the same effect of heating the studio and other rooms intended to be warmed. But in order to make the most of them, they require to be specially made for the place they are intended to occupy and the work they will have to do. The body of the smaller stoves is in all cases the same, only varying in size to suit requirements. The fittings vary according to condition of flues and the position of the room to be warmed.

Although this system has been patented by me, more especially as it applies to manufacturing purposes, yet I would willingly lay aside the terror of the patent law if any member of our Society would like to get one made for his own use. I may say, in addition, that to the virtue of requiring no castings (except the grate, for the smith will be able to complete the work himself), I will not only give my consent, but will assist any one of you with my advice to put the stove in working order.

THE LIME-LIGHT SIMPLIFIED.

BY A. PUMPHREY.

THE introduction of the simple form of oxyhydrogen jet known as the safety, or "blow through," has done much to popularize the lime light. This jet is used with a supply of common house gas, drawn by a flexible tube from the gas-fitting to the jet. There are many places where this cannot be obtained; then the operator has to fall back upon what is known under the name of the oxycalcium jet, where the hydrogen is replaced by a spirit lamp, the jet of oxygen being driven through that instead of the gas. There have been many attempts to improve this jet, but with any of the plans heretofore introduced it was the most unsatisfactory form of the lime-light, and the one that required the most skill to obtain and maintain satisfactory illumination, so that just in the places where operators were out of the way of getting information, there, at first start, the most difficulties had to be met.



The apparatus as above gets over these difficulties in the

simplest possible manner. A is a vessel made of strong tin, to contain some 16 oz. of fluid; a flexible tube at the top is attached to a brass tube, which will unscrew; at this aperture is introduced any volatile and combustible fluid, such as spirits of wine, turpentine, naphtha (wood or mineral), petroline, benzoline, gin, whiskey, or brandy.

Underneath this vessel is a lamp, which must be charged with spirits of wine or wood naphtha, neither of which smoke; this lamp must be lighted a few minutes before the jet is wanted; it will soon raise the fluid to boiling point, and the vapour which passes off is conducted by a short flexible tube to the jet, and treated in every way as though it were ordinary gas; the lamp is provided with an arrangement of sliding tubes, so that the flame can be regulated to produce any quantity of vapour, and the supply is regulated by the lamp alone, not by the tap on the jet; the supply of vapour is exceedingly easily regulated, and will burn steadily for an hour without any adjustment. There is, however, one point that requires attention, namely, that the jets being made of metal, they would condense the vapour; to prevent this, at the same time that the lamp underneath the vapourizer is lighted, two small lamps, B B, are hung upon the hydrogen tube; these raise the temperature of the metal to such a point that the vapour passes freely through without condensation, otherwise the vapour condenses, and is driven out of the jet as a fluid. I have tried this arrangement, and have burned it for ten hours at a time to test its practicability. I have experimented with two fluids—methylated spirits of wine, and benzoline—for dissolving lanterns; the former is the best. A branch at the top of the vapourizer provides a supply to each lantern. The spirit is kept burning in both lanterns, and the dissolving is produced by turning the oxygen from one lantern to the other. A single lantern will consume $3\frac{1}{2}$ oz. of spirit per hour, including the lamps.

For a single lantern I prefer benzoline, as it is cheaper, and converted into vapour with a less expenditure of heat than spirits; the light is also better; but for a pair of lanterns the smoke is an objection. A single lantern will consume about 2 oz. of benzoline per hour.

It is desirable to introduce into the vapourizer a good body of fluid, as the supply of vapour is more regular than when there are only a few drops on the bottom. In the accompanying woodcut the jet is drawn upright with the lime slanting. The plan is applicable to any form of jet, and the whole apparatus is small and compact, measuring 6 by 4½ inches. The lamps are made with screw caps, thus the whole is self-contained.

The above arrangement is on the safety principle, and can be used by any one with ordinary attention without danger; one pair of pressure boards, and one gas bag for the oxygen, only being needed, a light equal to that with house gas being obtainable, equal to two hundred candles.

THE NEW PATENT BILL.

As many of our readers are deeply interested in the subject of patents, we condense the following from an abstract, which appeared in the *Engineer*, of the new bill by the Lord Chancellor, recently read a second time in the House of Lords.

Clauses 1 to 4 are preliminary and definitive.

Clause 5 defines the constitution of the Patent Commission, which includes, as at present, the Lord Chancellor, the Master of the Rolls, and the law officers of England, Ireland, and Scotland, with five new Commissioners, who are to be unpaid, and are to be appointed by Royal Warrant. Two are to be nominated by the Lord Chancellor and three by the Board of Trade.

Clause 6 provides for the appointment of examiners, not less than two, and not more than four in number, to be chosen by the Lord Chancellor, who shall state in writing that they are "specially qualified for the office by legal or scientific knowledge."

Clause 7 refers to the appointment of referees, who "shall be persons specially qualified for the duty by knowledge of manufactures, art, or science." They are to be chosen jointly by the Board of Trade and the Commissioners every two years, and are to be "distributed in panels according to their several qualification."

Clauses 8 to 10 define the mode of making applications for patents. The applicant is to file a *full* specification of his invention, and any person having an interest in opposing the grant may do so. "The use and publication of the invention by the applicant, during a period of six months from the date of the application, shall not prejudice the grant of a patent for it (which protection from the consequences of use and publication is in this Act referred to as provisional protection)." The application shall, "on the expiration of the prescribed time," be referred to an examiner and a referee.

Clause 11. "The examiner and referee or referees shall consider the application and relative documents, and shall report to the commissioners thereon, and especially with reference to the following questions:—(a) Whether the invention is a proper subject for a patent within the Statute of Monopolies. (b) Whether the specification is sufficient. (c) Whether the invention is new, as far as as they can judge thereof from an examination of former specifications and other documents and publications in the Patent Office. (d) Whether the invention is in the nature, wholly or mainly, of a combination of known machinery, substances, or processes. (e) Whether, regard being had to the last mentioned consideration, or to the consideration that the invention is not of great importance or utility, or for any other reason, it is expedient that the duration of the patent to be granted for it (if any) be limited to seven years; or (f) Whether, by reason of the frivolous character of the invention, or for any other reason, it is not worthy of a patent.

Clause 12. The application, accompanied by the report of the examiner and referee, which is always to go with the specification, is to be transmitted to the law officer, who will give his opinion. The application and opinions will then be made public.

Clauses 13 to 16. Notice to proceed having been given by the applicant, the patent and a warrant for sealing will be prepared and submitted to the Lord Chancellor. If the law officers' report is adverse, the applicant may, nevertheless, petition the Lord Chancellor for the grant and sealing of a patent, but, "any person" may petition against the sealing, and the patent will not be sealed "unless a request for the sealing thereof is made within three months from the date of the warrant, and within the period of provisional protection." The sealing must take place within seven days before the expiration of the provisional protection, and not sooner, and every patent shall be dated the day of application.

Clause 17. Patents to extend to the United Kingdom, but may in certain cases also include the Colonies.

Clause 18. Powers are reserved to the Lord Chancellor to extend the period of provisional protection, and the period during which the patent may be sealed.

Clause 19 relates to foreign inventions and to applicants resident abroad, or to aliens wherever resident. The provisions are as follow:

1. A patent shall not be granted on the application, unless the applicant declares himself to be the first and true inventor, and no patent shall be granted in respect of a communication from abroad. 2. A patent shall not be granted after the expiration of a foreign patent for the invention, and, if so granted, shall be void. 3. If at the time of the application there is a foreign patent for the invention in force, a patent shall not be granted unless the foreign patentee is the applicant, and his application is made within six months after the date of the foreign patent, or of the earliest foreign patent (if there are more than one). 4. A notice of every foreign patent for the invention existing at the date of the warrant for the patent shall appear by indorsement or otherwise on the patent. 5. The patent shall cease on the ceasing of the foreign patent (if any), or of such one of the foreign patents (if more than one) as first ceases."

Clause 21 enables the patentee to amend his specification. No amendment will be allowed which would extend the patent beyond the original claims. Parties may amend after the patent is sealed.

Clause 22 provides that a patent may be revoked on petition to the Lord Chancellor, the proceeding by *scire facias* being abolished.

Clauses 23 to 26 regulate the granting of licences and provide for the registering of license deeds and assignments at the Patent Office, and do not materially differ from the regulations now in force.

Clause 27. Within two years of the date of a patent it may be revoked, unless it has been put in practice within the United Kingdom, or unless "the patentee fails to grant licenses to proper persons requiring the same, on terms which the Lord Chancellor deems reasonable."

Clause 28 empowers the Lord Chancellor to allow extensions of patents which have only been granted in the first instance for seven years, but the whole term of the patent is in no case to exceed fourteen years from the date of the original application.

Clauses 30 to 33 deal with cases of fraud.

Clause 34. "A patent shall have to all intents the like effect as against Her Majesty the Queen, her heirs and successors, as it has against a subject. But the officers or commissioners administering any department of the service of the Crown may, by themselves, their agents, contractors, or others, use the invention for the service of the Crown, on terms to be agreed on between those officers or commissioners and the patentee, or, in default of such agreement, settled by the Treasury."

Clauses 35 to 43 relate to procedure, and, with the remaining clauses, are mainly of a technical character.

The schedule gives the list of fees, which are generally the same as at present, the only material alteration being a reduction of £5 in the cost of a patent for the first three years.

A DRY ALBUMEN PROCESS.

BY FRANK M. PICKERILL.*

FIRST of all clean and albumenize the plates as follows:—

Coating for the Glass.

White of eggs	...	...	4 ounces
Honey	...	...	3 1/2 "
Iodide of potassium	...	...	60 grains
Bromide of potassium	...	...	15 "
Dry salt	...	...	5 "

Place all of the above in a large bowl, and with a wooden fork beat them into a thick froth; then let them stand twenty or twenty-four hours to settle. When settled, filter through four or five thicknesses of cambric into your coating bottle. After the coated glass has been carefully heated over a spirit lamp, it must be allowed to get perfectly cool before plunging into the silver bath.

Silver Bath.

Distilled water	...	...	1 quart
Nitrate of silver	...	...	4 ounces.

When the silver is all dissolved, add six ounces of No. 8 acetic acid; shake well for a few moments, and then filter through paper. The albumenized glass is to be plunged into this bath quickly, then allowed to remain there for ten seconds, and then taken out and washed thoroughly, and placed upon its edge in a clean and dark place to dry.

Developing Solution.—Have ready in a pint bottle a saturated solution of gallic acid, and in a four or six-ounce bottle a solution of the nitrate of silver, say five grains of silver to each ounce of water. When you wish to develop a picture, pour into a wide-mouthed two-ounce bottle as much of the gallic acid solution as you think will cover your glass; then place into the same bottle a very little of the silver solution; shake them together; then pour them over your glass, and the picture will soon begin to appear. This solution is to be allowed to remain on the glass until the picture is fully out in all its detail; then the picture is to be well washed; when washed, it is ready for the hyposulphite of soda solution.

Hyposulphite of Soda or Fixing Solution.

Water	...	...	16 ounces
Hyposulphite of soda	...	...	4 "

Dissolve and filter. This solution is to be allowed to remain until the picture is all cleaned up; then wash it well, and put it on some clean place to dry. When the picture is dry it is ready to print from.

Note 1st.—Should small dark particles form on the glass while developing with the pyrogallic acid, you will at once pour off the developer and wash the plate and put on new.

Note 2nd.—When heating the glass over the spirit lamp drain all the albumen off you can; but should the film appear thicker at one end than at the other, flow it again, and flow off from the opposite corner, heating as before.

Note 3rd.—If you want the plate to work quicker, first coat with collodion, let dry, and then flow with the albumen as directed.

Time indoors one to three minutes, outdoors a half to three minutes. A great deal depends on developing, as it can be over-developed or under-developed, according to the amount of time given the exposure.

Note 4th.—In developing, place the glass on four wires standing on end supporting each corner of the glass, and when developing, place a piece of white paper under it, and you will soon see the picture appear.

gave, as we have said, most valuable results with emulsion plates, and also, we understand, with dry plates by various other processes. With the beer and albumen plates prepared by Captain Abney's process, and used in the transit records, the formula, thus greatly modified, was, however, found to possess advantages which render its accurate statement in minute details important. The mode of intensifying with pyrogallie acid, citric acid, and silver, remains as stated in our former article.

REMBRANDT PORTRAITS AND REFLECTED LIGHTS.

A SUPPLEMENTARY PAPER.
BY G. CROUGHTON.

SOME remarks in the excellent leader in last week's NEWS suggest to me that our esteemed Editor has somewhat mistaken my meaning as expressed in the paper contributed by me to the South London Photographic Society,* and upon looking over it again I think perhaps I have not expressed myself sufficiently clear upon the question of Rembrandt portraits; I therefore take this opportunity of clearing up any misconception that may exist as to my real meaning.

So far from condemning all Rembrandts or shadow pictures, I am convinced, from my own practice, that in most cases a more characteristic—and certainly a far more refined—portrait may be secured by placing the face in half light, with a very few touches of bright light, if that light be used with discretion and feeling; and no photographer with any pretension to artistic knowledge or taste would condemn this, or any other style of lighting, simply because it was unusual. I wish it therefore to be distinctly understood that I in no way agree with the disparagement which has been bestowed upon the so-called Rembrandts as a style; my remarks were intended as a caution against the abuse of reflectors in lighting up the shaded side of the face. I had no intention of condemning the use of reflectors, any more than I had of condemning all retouching. I do not use them myself, because the studio I work in is somewhat narrow, and I can get all the reflected light I require from the wall, aided by a long light somewhat in front of the sitter (or rather, I should say, over the camera); but in large galleries, where reflecting surfaces are a long way (comparatively) from the sitter, reflectors are absolutely necessary; but they want great care, combined with judgment and artistic feeling, in their use, for by their misuse, effects at once unusual and unpleasing are perpetrated.

It may be, as the leader says, that there are no conditions of lighting that can be really false or unnatural; yet I have had negatives pass through my hands upon which reflecting screens had done their worst, and the result has been quite false to nature, in the same way as over-touching is false—destroying texture, and giving an effect to the face of being out of drawing. One would never, under ordinary circumstances, see a face under the conditions some of these portraits must have been taken. I have one now before me in which the reflected light upon the extreme edge of what ought to be the shaded side is as strong as the dominant light, but that reflected light is upon the face only, the drapery being in deep shadow, clearly showing what a small reflecting screen must have been held very close to the face on that side; the result is that there is actually a cast shadow from the hat upon the forehead of what ought to be the shaded side of the face; the two edges of the face come forward, and the centre of the face being the darkest, and, moreover, between the lights, is made to retire. This, to say nothing of the two

opposing lights in the eyes, gives an effect at once unnatural and painful. Photography may have (and, indeed, has) reproduced what was before it, but the operator had done his worst upon his model, and given her an unnatural appearance to commence with; therefore, I contend, the result is practically false and unnatural.

To get the best effects in shadow pictures requires some study, and should be set about with a good knowledge of what is required. I can speak of my experience in the studio in which I am now working, which is some nine feet wide and eighteen feet long, with twelve feet of glass, and the ordinary ridge-roof; I can also speak of experience in another nearer thirty feet long and some twelve feet wide; and of the largest I have worked in, which was sixty long, forty feet wide, and some twenty feet to the ridge; in this gallery there was only one small part used of it, which in size would correspond very nearly with the one in which I am now working, all the other part being screened off. Here reflectors had to be used, but not the small hand reflectors I have seen advised; they were large three-leaved screens, some eight feet high, each leaf being two feet wide, covered on one side by black and on the other by white calico. These were placed, as a rule, several feet from the sitter, the three leaves enabling the operator to adjust his reflectors to a nicety; as the end leaf would, if required, be brought somewhat in front of the sitter, the reflections were soft and subdued, as from the wall of a room or other ordinarily seen reflections. In each of these galleries the background was placed in the same position, viz., brought forward so that its edge rested against the glass, and then sloping inwards away from the light, while the camera was moved to the opposite corner, so that the lens looked towards the light, the sitter being placed about midway up the gallery, all light being either stopped out entirely, or subdued at the camera end up to the level of the sitter, thus leaving open the light behind and at the side, but *not in advance*. This is also my own practice; the side light up to the sitter is entirely blocked out with an opaque blind, the top light, to correspond, being subdued by a white one, which lets in enough light to relieve the dark shadow, and so secures texture. My reflected lights are the natural reflections from the wall of the studio, which is papered with a light green-grey paper. I get more or less strong light upon the face by moving the opaque blind a little in advance or behind the sitter, as the face may require or taste dictate. My experience is in favour of bold lighting and full exposure; by this both brilliancy and softness are secured. Remember that you must see the details in shadow, or you will not be able to develop them, and that no shadow, however deep, should be without them. The difference in the exposure in my studio is that in a good light I get the ordinary lighted head in from eight to twelve seconds; the Rembrandts take from twenty to thirty seconds.

BROMIDE OF SILVER FOR PRINTING.

BY W. T. BOVEY.

THERE is nothing new beneath the sun, depend upon it. Even our truly wonderful photography, despite its few years of existence, has its history linked with coincidences obtained from identical thoughts arising in the minds of independent discoverers and experimentalists.

About six years ago, at the request of the late Mr. Trull, of Falmouth, I undertook to prepare for him a photographic paper sufficiently sensitive for direct solar-camera printing; and knowing full well that no amount of chloride would yield what was wanted, I proceeded to experiment with bromides, which, used in admixture with albumen, gave what was needed in the way of sensibility, but the resultant prints were not so rich in colour as are those produced with albumenized paper prepared in the usual way. It therefore occurred to me that a combina-

* Mr. Croughton is here under a misapprehension. Our leader was written before his paper was read, and could, of course, have no reference whatever to his remarks, with which we fully coincide. Gross ignorance in using either direct or reflected light may issue in results unusual and grotesque, which are so unlike the ordinary aspect of nature that they may be fairly called unnatural.—Ed.

The Photographic News.

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GELATINE NEGATIVES.—INTENSIFYING BY PERMANGANATE OF POTASH.

WE have been favoured with a letter from Mons. Chardon, of Paris, calling attention to a communication he made to the Photographic Society of France, at a recent meeting, on a method of reproducing negatives by the carbon process, and intensifying the image by means of permanganate of potash. The process consists in first producing a transparency on glass by the ordinary operations in carbon printing. From this transparency a negative is then produced, by a simple repetition of the same proceedings. Any degree of intensity may now be imparted to this image by the application of a solution of permanganate of potash, which is decomposed by the gelatine, intensity being secured by the oxide of manganese deposited. In making this communication to the Society, Mons. Chardon believed, of course, that it was really, as he knew that so far as he was concerned it was an original discovery. It was announced, however, that Mons. Lambert, whose name is associated with a method of enlarging and finishing, had been beforehand, and had in October last secured a patent for this mode of intensifying. Others have also made claims in reference to the process, and Mons. Chardon, having been informed that we had first announced the use of permanganate for intensifying as early as 1868, is good enough to express a wish that we should enable him to give publicity to our claims.

We are fortunately in a position to state the case very precisely. In the year 1868, it is true, we announced, as the result of some experiments of our own, the value of permanganate of potash for intensifying negatives; but these were ordinary silver images. It is to Mr. J. W. Swan, at a later date, that photographers are indebted for the process of intensifying images in gelatine by the use of the salt of manganese. In the autumn of 1871, Mr. Swan favoured us with details of his discovery, and after verification we described the operations in the PHOTOGRAPHIC NEWS of November 3rd of the year in question. It may be interesting to quote, briefly, the salient details from the article in question. Having described the operations of producing a transparency in carbon, we proceeded as follows:—"The transparency thus produced is generally vigorous enough to reproduce negatives from; but if further intensity be required, it may be secured by the method which we shall presently describe. To produce the negative the same process is repeated in all its details, using the transparency as a *cliche*. When the negative has been developed, it remains to be intensified; and it is in this part of the process that the chief novelty consists. After thoroughly washing, a solution of permanganate of potash is applied to the negative, by which a

process of intensification is secured similar to that produced on a silver image by the same solution. The permanganate is decomposed by the gelatine, and a precipitate of sesquioxide of manganese, of a rich chestnut-brown tint—or, at times, a brown inclining to olive, which is highly non-actinic—is thrown down on the image, readily producing printing intensity. The strength of the permanganate solution is not very important; we have used Condry's red fluid, which, diluted with three or four times its bulk of water, answers well. This method, of course, may be employed to intensify the transparency if it be found desirable to increase its vigour before employing it to print the negative. A similar method might be employed to modify the tint of carbon prints if desired."

The patent of Mons. Lambert, is, therefore, we fear, rendered invalid by prior publication of the process. The process itself, which is both simple and efficient, has, singularly enough, not come into general use. As an aid to reproducing negatives by means of carbon tissue it possesses much value, which has not been generally recognized. It may be found also to possess another use. One of the common complaints against negatives produced by means of the gelatino-emulsion process is lack of sufficient vigour to give brilliant prints. Here is a simple method of intensifying them, which it is probable may remove every difficulty.

CAPTAIN ABNEY'S MODIFICATION OF THE STRONG ALKALINE DEVELOPER.

WE gave, in a brief article, three weeks ago, some details of the mode of working dry plates employed by Captain Abney in his photographic records of the transit of Venus, whilst in Egypt. We learn since that a slight error crept into the formulæ which it may be important to correct—the more so that, in developing the plates in question, prepared by the albumen and beer process, he found a departure from Colonel Stuart Wortley's formula necessary to perfect success. The principle of using a strong alkaline developer is due solely to Colonel Wortley, and it has proved very important and valuable in dry plate work. The formula, as employed by the Colonel for bromide plates, and found efficient by Mr. R. Manners Gordon for gum-gallic plates, stood as follows:—

No. 1.—Pure strong carbonate of ammonia	80 grains
Water	1 ounce
No. 2.—Bromide of potassium	120 grains
Water	1 ounce
No. 3.—Pyrogallic acid	96 grains
Alcohol	1 ounce

To each drachm of No. 1, add one minim of No. 2, and from one to six minims of No. 3, according to the density required in the negative. If liquid ammonia were preferred, the formula stood thus: six minims of a 96-grain pyrogallic acid solution, three minims of the 120-grain solution of bromide, and two drops of strong liquid ammonia (sp. gr. 880) added to three drachms of water.

In this formula it will be seen that each ounce of developing solution contained a fraction more than three grains of pyrogallic acid, a fraction over two grains of bromide of potassium, and nearly six minims of liquid ammonia. Captain Abney's formula differs from this in containing nearly four times as much pyrogallic acid, no retarding—or, as Captain Abney phrases it, destructive—bromide, and an exceedingly diminished proportion of ammonia. The corrected formula, employed in developing the transit plates, stands as follows:—

Pyrogallic acid...	12 grains
Water	1 ounce

To this were added two drops of a 20 per cent. solution of liquor ammonia—in round numbers, something like one-twelfth of the proportion used in Col. Wortley's formula. The strong developer prepared by Col. Wortley's formula

gave, as we have said, most valuable results with emulsion plates, and also, we understand, with dry plates by various other processes. With the beer and albumen plates prepared by Captain Abney's process, and used in the transit records, the formula, thus greatly modified, was, however, found to possess advantages which render its accurate statement in minute details important. The mode of intensifying with pyrogallie acid, citric acid, and silver, remains as stated in our former article.

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tion of bromide and chloride salts—one-third of the former to two-thirds of the latter—would answer my purpose better than would the use of chloride alone. And on trial my anticipation was realized. The paper, so prepared, turned out to be very sensitive—sufficiently so, I presume, for solar-camera printing, as Mr. Trull subsequently used a considerable quantity in that way.

I somehow omitted publishing the discovery at the time, probably deeming it of very little importance; at all events, if bromo-chloridized papers are destined to have any run of popularity, Prof. Schultz-Sellac is fairly entitled to the honours of prior discovery, inasmuch as he was the first with his printed particulars. My present impression, however, induces the belief that for ordinary silver printing no practical advantage is gained by an addition of sensitiveness. For exceptionally dense negatives such an increase would be an advantage; but, taken as a rule, printers have quite enough to do to keep pace with the printing when the light is anything like favourable. This fact, however, does not detract from the value of a discovery, because in an art like photography, which has so many demands, its practitioners can never overstock their reserves.

ON NEW PRINTING METHODS.

BY DR. H. VOGEL.*

DURING the many years that I have been actively engaged in photographic journalism, I have had an opportunity of remarking that certain photographic novelties pass away without leaving a trace behind them, while others, which are far less deserving, make a great noise in the photographic world. Thus the pictures produced by Denier, of St. Petersburg, produced a vast amount of correspondence and discussion when first brought forward. Many published details of the process openly, while others offered to divulge "the secret" for a sum of money varying from three or four pounds upwards; others, again, expressed themselves perfectly willing to communicate the whole of the details to me if I would interest myself in getting them appointed Court Photographers, &c. After all these experiences, one would fancy that the whole world were about to produce photographs *a la* Denier, but, as we have seen, only a few, a very few, have taken up the method. At the same time, this particular method of printing is not a very difficult one, and may be adopted with advantage, probably, by such photographers who have not a very large business, and who are unskilled in the matter of retouching.

The simplest way of proceeding is to print the negative in the usual manner for about two-thirds of the time required, and then to introduce between the paper and the *cliche* one or several plates of mica, or films of white, dry, transparent gelatine. How many such films are necessary can scarcely be predicted at the outset, but a thickness of half a line should suffice. A few experiments are necessary to settle the question. Through this medium the *cliche* does not print sharply, and thus the outlines are softened, and spots on the face, as well as any wrinkles that may exist, are rendered less prominent. For this reason any previous touching of the negative is rendered unnecessary.

The peculiar waxy character of the Denier prints do not seem to be altogether approved by art critics, but the public generally seems to be very pleased with it.

More difficult to carry out are two more novel processes, which are offered for sale by travelling agents, viz., the Van der Weyde and Lamberttype processes. As regards these two processes, I think photographers in a small way of business would do well to abstain from them. Both processes yield, in the hands of skilled retouchers, results which are very taking with the public. I say advisedly "with the public," for I personally share the opinion of a photographer who recently said to me: "I do not find the Van der Weyde pictures at all to my taste, but the public will be enchanted

with them, and I shall produce them, therefore, not from art motives, but from those of business." In addition, I may remark that my friend has, as yet, received but few orders for such pictures. We should all of us like to find ourselves up in the heaven, but the cloudy leaden-coloured sky, such as M. Van der Weyde surrounds us with, seems to please but a few.

Photographers should be exceedingly careful of purchasing processes of this kind. It is well, in the first place, to see what the journals have to say on the subject, and to learn something of the verdict accorded by those in the Capital; the reason why sellers of photographic novelties usually avoid societies is generally because they do not desire to have discussions upon their inventions.

The Van der Weyde process, in which an image is represented in a shading secured by means of graphite and pumice, is scarcely suitable for photographs; more sympathetic appears the new Lamberttype, although the latter presents no novelty, being a negative retouching process of an elaborate character, which, it should be understood, is only adapted to very large negatives. Lambert employs it for enlarged negatives exclusively. The front and back of a negative are covered with a fine structureless paper, and this is worked upon in a suitable manner with black lead. The negative itself, in order to be adaptable to the process, must be very thin. For this reason the application of the process is limited, and the more so because of the necessary routine in the matter of retouching the negative. The mere making of strokes upon the paper is not enough, but one must know exactly where and how to do it. It is impossible to describe; one must be shown. Those, however, who have seen the method carried out, cannot do likewise, unless they possess some amount of artistic skill.

In a modest manner I have for some time past used the device of covering my negatives with paper, and with the greatest success. If, for instance, it is necessary to protect a thin part of the negative—the foreground, for example—from printing through, I paste over the back in this part a bit of tissue or tracing paper, and with a pencil work up such parts as I desire should be thrown up. In portraiture I have often employed the method when the background has come out too light. I then cover the figure on the back with paper, the outlines being carefully attended to, and in this way I have secured the figure of a much lighter nature than the background. If the paper seems to cover up too much because of its opacity, then I employ negative varnish, which is applied with a brush, and is more transparent.

All this, however, is not new, for I have employed it for many years already, and I should be very sorry to see anybody call it Vogeltype on my account. Indeed, as it is, I think we have quite enough *types* of one sort or another, with proper names attached, and may certainly dispense with any more.

ON THE EDUCATION OF PHOTOGRAPHERS.*

WHEN photography was in its infancy, it recruited its followers from all rank of men. At first, it was the painters and draughtsmen with more business than artistic knowledge who occupied themselves with the matter, and worked the new art as if it were a gold field. Later, every calling gave its contingent of men and women to the art, all of whom cultivated it with much profit and advantage to themselves, for the demands of the public were at first very moderate indeed. People were so enthusiastic over the invention, and the magical work of the sun's rays, that they were glad to give a high price for any specimen of the new art, no matter whether it was good or bad. Moreover, the artistic knowledge of the public is not at any time very deep; the number of real art connoisseurs being exceedingly small. The true art critic can only be formed by studying the highest works of art in existence. But who has opportunity for this in our small town, and

* Photographische Notizen.

* Photographische Mittheilungen.

how many are there of those dwelling in the larger cities who make any use of their opportunity?

Everyone, it is true, is born with a certain amount of taste, some possessing much, some little. By education this is remedied more perfectly. In Germany a taste is cultivated for music especially, but not for painting or drawing, the instruction given in schools being insufficient to form the taste of students in this direction. Children learn to draw straight lines, and to do a little colouring; they may even be taught how to copy a plaster bust, or a flower; but no one tells them what constitutes a work of art. Some of the great painters—Raphael, Michel Angelo, and others—they hear mentioned sometimes, but why these were considered great artists remains to them a mystery. Yet nothing would be easier than to place before the scholar a collection of photographs of the grand paintings in our possession, so that they might understand what the old masters have really given us. It is no secret that many a capable photographer speculates upon this absence of artistic knowledge on the part of the public, and furnishes pictures without scruple, the artistic defects of which are well known to him, in the hope that people are not aware of their presence. Frequently they succeed, but not always.

When photography grew out of childhood, and those with artistic talent occupied themselves with the art, so that the mechanical productions of the camera bore the impression of an artist, the better classes of the public began gradually to appreciate the difference between good and bad pictures; and although many were unable to specify their reasons why they liked such-and-such a photograph, their instinct was sufficient to indicate to them which was the better production and which the worse. The art photographer in this way soon got ahead of the mechanic; and it often happened that a man who had been doing a flourishing business for some time found his affairs suddenly take a turn for the worse, because an opposition photographer started in business, whose taste, exhibited in his productions, at once won the favour of the public. Whether he liked it or no, the crude worker found it necessary to study the artistic principles upon which the success of his neighbour was based. Laboriously did everybody strive to do a little artistic retouching, to take a lesson from Petach's mode of lighting, to study Rembrandt effects, and the Adam-Salomon style of portrait; and the most diligent soon became apt pupils. In this, however, those of course had the advantage who possessed most inherent taste, and thus it has come to pass that a great deal of knowledge is now necessary on the part of photographers, which it takes a long time to grow familiar with. The time when after six week's practice you became a fall-blown photographer is long since past and gone. We expect far more now-a-days from the perfect portraitist, albeit there are few who have patience enough to learn systematically all that is requisite and necessary.

It is not, of course, imperative that every photographer should be a man of high culture; as there are two distinct grades in military life, so there are in the photographic profession. Those of small education and little energy may become good printers, and even skilled operators in a mechanical way; but they will advance but little beyond, for such people do not care to learn anything, and are quite content to remain in the position they find themselves. They receive a certain fixed rate of wages, and do not desire to come into contact with the portrait-seeking public. We know many a thorough negative retoucher who is of little use when it is a question of doing anything else, and we know, too, of good operators who cannot pose gracefully, and are very much at fault in lighting up their models. It not unfrequently happens that people of this kind obtain favour with a class of the public who require no artistic taste, and who find pictures of inferior quality good enough for them.

The position attained by young photographers much

depends upon their own ambition. It often occurs that the son of a photographer learns the art with the view of carrying on his father's business, or of establishing one for himself. In this case the position to which he would attain is often a high one. The young man gets thoroughly educated in his work, for he learns, first of all, business habits (the main thing being not only to make pictures, but to sell them), and then he is instructed in the technical part of his work, so as to become a good operator; furthermore he learns to know the public, to practise himself in the arrangement and lighting of his sitters, and, finally, acquires the requisite skill in negative retouching.

All these things can only be successfully acquired by those who have been grounded in some scientific knowledge. Photography, as a chemical operation, requires a knowledge of chemistry. It is ludicrous to hear skilled operators maintain that one need not necessarily possess chemical knowledge. The truth of the matter is that they themselves know something of the elements of that science. They may not have learnt it at school, but they know very well from practice that pyroxilin dissolves in a mixture of alcohol and ether; that nitrate of silver is soluble in water; that common salt precipitates silver in solution; that hyposulphite of soda dissolves salts of silver, and so on. This is all chemical knowledge, and if any one will take the trouble to read through the list of photographic defects that are recorded in the printed handbooks on the subject, he will find that a great deal of chemical knowledge is requisite to avoid such accidents. How often have we heard of the mechanical operator committing the grossest blunders in employing permanganate, india-rubber, acid, or ammonia, simply because he had no idea of the chemical action of these substances.

The same mistakes are made with the optical apparatus, arising from ignorance of these instruments. Many obtain lens after lens, from which they expect the most impossible things, and they obtain in the end no more than a better photographer secures from one or two instruments.

For this reason it is obvious that a knowledge of the outlines of optics and chemistry is very necessary in the education of photographers in the case of such aspirants who desire to become something more than mechanical workers. Before all, it is necessary that they should cultivate taste in artistic matters. This may be done in two ways: by practice in sketching, which secures skill to the hand for retouching purposes, and educates the eye so as to aid in the posing of models; and by studying the history of art, in which are included examples or copies of the finest masterpieces of all time. Further, a course of lessons in perspective and anatomy may be added, for the latter teaches of one of the main points in portrait photography, the human form.

To undertake studies of this kind is, of course, only in the power of those with means. So long as there is no photographic academy at which aspirants can study, we would recommend all those who can do so, to reside for one year in such a capital as Berlin, and to make use of the opportunities there afforded. Here are to be found establishments where art-industry is especially fostered, and opportunities enough for the study of different things bearing on photography, viz., drawing, anatomy, art history, chemistry, photographic chemistry, and optics.

Those who use their time well may secure the proper scientific knowledge in six months, but for most students a year is not too much for the purpose.

It is generally the wish of all young hardworking photographers to serve as assistants for some time in one of the more renowned studios in the capital. Unfortunately, the establishments in which anything can be learnt are very few, and the principals are not always in a position to take assistants. It is not because they do not wish to do so, but it is a well-known fact that a third person is in the way in taking a portrait. The time, too, is too valuable in a busy studio, and the attention of the principal is too

much taken up for him to pay any regard to a pupil. Not unfrequently is the complaint heard from pupils that, instead of being allowed access to the studio, they are employed only in polishing plates and in stopping out defects in prints, experiences which could be gained just as well elsewhere. In this respect only a photographic academy could help, in which pupils could be instructed in posing and lighting with living models.

A PHOTOGRAPHER'S EXPERIENCES IN THE LIBYAN DESERT.

BY PHILIPP REMELE.*

NEW YEAR'S EVE we solemnized as well as we could under the circumstances. We had no goose, neither would the good people of Farafrah allow us to catch a couple of ducks that were swimming about on the principal pond of the place. But we managed to get a turkey, and this, and a glass of grog brought with us from Europe, served to while away pleasantly the last hours of the old year. At midnight the servants got out our fire-arms, and we saluted the new year with many a salvo, and illuminated our camp with the aid of magnesium wire.

On New Year's Day I made an excursion to the western portion of the desert, about six miles from Farafrah. Professor Zittel, who had visited the spot the day before for geological purposes, had called my attention to certain interesting places in the vicinity. As I did not start till eight, and the camel that carried my baggage was a remarkably slow animal, I did not reach my destination till nearly eleven. In the meantime it had grown very warm, and as I could get no shelter for my tent, the temperature inside it, notwithstanding that a north wind was blowing, was 28° Reaumur. The bath and chemicals simply refused to act, and the desiccation of the film over the plate was of a most unequal character. The collodion film was still wet at the lower portion of the plate, while above it was already dry, and after treatment in the silver bath the well-known blue streak was visible. The silver bath became turbid, and caused the plate to fog. By strengthening the liquid, however, and adding a few drops of glacial acetic acid, these defects were removed. All this took time, and it was fortunate for me that there remained still plenty of light to operate with. With a little trouble, I was enabled to take my first pictures of the desert. The exposure was excessively short. With an aplanatic lens of Stenheil's, having a diaphragm of 50, five seconds were sufficient, and a stereoscopic image was taken in much shorter time. The plates developed very flat, and required much intensifying. I attributed this to the short exposure which the general illumination of the landscape necessitates. In such landscapes as these everything is in a full glare of light, and in a few places only is there a trace of dark shadows. A longer exposure, in which the plates would be rendered more dense, cannot be made use of, as it would be untrustworthy, the shadows not remaining sufficiently clear. Only with a short exposure can we hope to be successful.

As the expedition was to start next day at ten o'clock, and I had not taken any pictures of Farafrah, I was up by time. These pictures were undertaken without trouble. When I came to the rendezvous in the garden, I found our tents had been struck, and everything was packed ready for our journey.

But the Arabs who accompanied us gave so much difficulty that we could not make a start. One of them, especially, was always playing some stupid trick or other. After a number of iron boxes had been filled with sweet Farafrah water for our journey to Dachel, this latter was ordered to empty some other boxes which had been filled at Bir Kerani, a day and a-half's journey from Farafrah, with brackish and scarcely potable water. Instead of doing as

he was told, the man went and poured all the sweet Farafrah water away, and left the salt liquid in the boxes. The trick was, of course, discovered, but the filling of the boxes again from the distant well took a long time. Other of our Arabs refused to proceed any further, because they said they had not prayed sufficiently to ensure their safe arrival at Dachel. They would not have finished their devotions till the afternoon, and the end of it was that the start was postponed till the following morning.

The first day's journey towards Dachel was of little interest. We journeyed for nearly three days over an almost even track, 500 to 1,000 yards broad, bordered on both sides with sandhills of about thirty to fifty metres high, a sort of natural highway of gigantic dimensions and monotonous form, which we, for want of a better term, called a road. Slowly ascending, the path lost itself in a high plateau full of picturesque lime rocks and steep mountain walls, forming a labyrinth through which our camels stepped slowly and laboriously. As the beasts dared not be overburdened in this heavy and not undangerous portion of our journey, we all of us walked on foot, and the interesting nature of the landscape did away with any feeling of fatigue. Through a grand rocky archway, named, after the German consul in Alexandria, Bab el Jasmund, we came to the long-wished-for declivity stretching towards the oasis Dachel. A second and more imposing natural door, called by Rohlf, after the well-known traveller Caillaud, Bab el Caillaud, gave us a view over the valley in the wilderness of the finest beauty, in the vicinity of the oasis.

On the 7th January, at four in the afternoon, we came to Gasr Dachel, the capital of the oasis; we were welcomed by the head officials of the place, and the next day moved into a house made ready for our reception, which, although of a somewhat tumbledown description, was nevertheless better adapted to a sojourn of some days than our more airy tents.

In Dachel began my actual work. For the further journey west, Gasr Dachel was made principal dépôt, and the command of it was given to me, so that I had plenty of time to depict the interesting points around Dachel and the adjoining portions of the Desert. For the latter purpose I arranged excursions of my own, sometimes stopping out two or three days together.

In the upper portion of our house I established a portrait studio, in order to comply with M. Rohlf's wish to secure some types of the inhabitants of these oases. For my purpose, I made use of a smooth cloth background, and a very stable head-rest. With the aid of an arab sheik named Mohamed Daud, who was in good odour with the inhabitants, I was successful in securing pictures of a large number of these brown Africans. No fees were, of course, to be had, but, on the contrary, every model had the sum of one franc paid him for the sitting. Without this stipulation had been made, I should, I fear, have done but little business.

The weather during the time of my sojourn at Dachel was in no way so favourable as my experience of Siut and Farafrah had led me to expect. Very often there was a powerful wind that materially interfered with my operations, and sometimes we were troubled with a samoom, which rendered the practice of photography simply impossible. After a wind has once begun to blow, it is some time before the sand has been loosened sufficiently to be carried on with it. A light colouring of the upper portion of the distant sand hills, which sometimes occurs very suddenly, is the first signal of the coming samoom. The sand is blown in streaks over the desert first of all, and only rises a little from the surface, so that for some time one may continue the journey feeling the sand eddying past one's knees. As the wind grows stronger, the sand rises more and more, until one's lofty seat upon a camel no longer affords shelter. The sand striking upon the skin produces a strong pricking sensa-

tion, and the fine particles are driven through one's clothes and into every fold of the packages.

As the wind grows stronger the sand rises high into the air, so that the whole atmosphere is impregnated with it; the sun appears red like a sharply cut disk in the heavens, and the sand fog is so thick sometimes that you cannot see fifty paces from you. Sometimes this fog divides, and then there are to be seen sharply outlined sand clouds of a similar form to those in the sky.

(To be continued.)

A FEW FACTS ABOUT ALBUMEN.

THE *Western Photographic News* gives the following summary of facts about albumen:—

Albumen is an organic compound found both in animal and vegetable substances. Its properties are best studied in the white of an egg, which is a very pure form of albumen. It also abounds in the blood and chyle, and more or less in all the serous fluids in the animal body; it also exists in the sap of vegetables and in their seeds, and other edible parts. Albumen forms the starting point of animal tissues. The chief component elements of albumen are carbon, hydrogen, nitrogen, and oxygen, with small proportions of sulphur and phosphorus. It is believed to be a definite chemical compound, though the exact proportions and the rational formula have not been definitely ascertained. Carbon forms fifty-four per cent. of it, nitrogen sixteen, and sulphur two. The disagreeable smell arising from the decomposition of eggs is from the generation of sulphuretted hydrogen.

Albumen is capable of existing in two states: in one of which it is soluble, in the other insoluble, in water. As soluble in water, it is found in the egg, the juice of flesh, the serum of blood, and the juice of vegetables. Soluble albumen may be converted into the insoluble form in the following ways:—

1. *By the application of heat.*—A moderately strong solution of albumen becomes opalescent and coagulates on being heated to about 150° Fah., but a temperature of 212° is required if the liquid is very dilute.

2. *By addition of strong acids.*—Nitric acid coagulates albumen perfectly, without the aid of heat. Acetic acid, however, acts differently, appearing to enter into combination with the albumen.

3. *By the action of metallic salts.*—Many of the salts of the metals coagulate albumen completely. Bichloride of mercury, acetate of lead, sulphate of copper, and nitrate of silver form insoluble compounds, and the egg is therefore used as an antidote to these poisons. The white precipitate formed on mixing albumen with nitrate of silver is a chemical compound of the animal matter with protoxide of silver, and has been termed albuminate of silver. Albumen also combines with lime and baryta. When chloride of barium is used with albumen, a white precipitate usually forms. By long keeping, albumen loses its alkaline reaction, and becomes sour and more limpid than at first. Mucous threads like cobwebs form in it, which appear to be caused by oxidation.

Ammonia added to albumen is said to preserve it for a longer time, and a lump of camphor floated in the liquid has a good effect. Alcohol, ether, creosote, and tannic acid likewise cause the coagulation of albumen.

Correspondence.

LATITUDE AND LONGITUDE BY PHOTOGRAPHY.

SIR,—In your French Correspondence I see a naval officer has been applying photography to delineate oceanic storms. That our art-science has many valuable applications, other than that of portraiture, need scarcely be said; but that the purely scientific aspect of photography has but little inte-

rest to the general body of its professors I am pretty well convinced; and hence, being in possession of a means whereby it will aid, if not supersede, the present means employed to obtain latitude and longitude from the sun at sea, I shall have pleasure in sending particulars to the officer in question if M. Lacan can supply me with his address, preferring so to give the method an opportunity of being useful, rather than lie in my desk, as it now has done for over a year. Originally I had written it for non-nautical readers. Upon receipt of the required information, I will re-write it to suit changed circumstances.—
Yours, &c.,
W. E. BATHO.

ALBUMENIZING PLATES.

DEAR SIR,—I doubt not that many of your readers who may be interested in practical photography, particularly when preparing plates for the "dry process," have often experienced difficulty in smoothly applying the preparatory coating of albumen, unless they resort to the careless general practice of first dipping the plate into water, which so largely dilutes the mixture as to seriously lessen, when it does not entirely destroy, its efficacy; and the result is, that the film will subsequently slip during development, and ruin the negative.

For a long time I experienced great annoyance myself from this source, until I discovered that all difficulty could be removed by simply breathing upon the plate before pouring on the albumen, when the solution will run as smoothly and evenly as the best collodion. If, during the operation, the fluid shows any hesitation at any point, it is only necessary to breathe upon that particular spot, and the difficulty will be obviated.—I remain yours respectfully,

J. HENRY WHITEHOUSE.

Hotel "Beau Rivage," Ouchy, Lausanne, Switzerland.

NEW LIGHTS IN PHOTOGRAPHY.

DEAR SIR,—In reply to "Enquirer" in last week's *News*, will you permit me to point out that Moule's light was a pyrotechnic composition of the same nature as the "Bengal light" used for signalling in the Royal Navy. It consisted of nitre and red orpiment (sulphide of arsenic), and must be burnt either in the open air, or within a glass lantern case with good draught to carry off the arsenical fumes. The "explosive powder" mentioned by your correspondent was not likely to have been sulphur and nitre alone, but probably contained in addition carbonate of potash, which serves much the same purpose as the carbon in gunpowder. The old "pulver fulminans" was a mixture of one part of sulphur, two of pearlsh, and three parts of nitrate of potash, and behaves in a very different manner to any mixture of sulphur and nitre with which I am acquainted.

—Yours truly,

JOHN SPILLER.

Talk in the Studio.

THE PHOTOGRAPHIC SOCIETY.—At the meeting of the Photographic Society, to be held on Tuesday evening next, Captain Abney will read a paper detailing some of his photographic experiences in Egypt in connection with the Transit of Venus Observations.

A DAILY ILLUSTRATED NEWSPAPER.—On the 10th March a paper will be read before the Society of Arts by Mr. Henry Blackburn, on "The Art of Illustration as Applied to Books and Newspapers," when the feasibility of daily illustrated newspapers will be discussed, and some particulars of the working of the *Daily Graphic* of New York communicated to the meeting.

ASSOCIATION BELGE DE PHOTOGRAPHY.—This society, which is only a few months old, has already considerably more than two hundred members. A monthly *Bulletin* is published by it, full of excellent matter and photographic illustrations. A peculiarity of this Society, worthy of note, is the establishment of a section in each large city. The members of each section

meet at least once a month, and communicate their labours to the central committee. The society also elects into honorary connection with its body, foreign photographers whose names have been associated with the progress of the art. At a recent meeting, Mr. J. H. Dallmeyer and Mr. Wharton Simpson were elected honorary members.

MAGIC LANTERN SLIDES BY TRANSFER.—Mr. Gordon Ramsay gives the following in the *English Mechanic*:—"Thoroughly saturate plain Saxe paper with a solution of gum benzoin in alcohol, one part of benzoin by weight to ten of methylated spirit. When dry, press flat and albumenize, and sensitise in a 60-grain bath, the print being finished in the usual manner. Then let the surface of the glass to which the picture is to be attached be floated with a solution of gelatine, and placed on a levelling-stand till the surface is just tacky; the picture may then be pressed in contact and allowed to dry. Then apply strong alcohol to the back of the paper, which will dissolve the gum benzoin and leave the albumen picture attached to the glass. There are many other processes, but I consider this the most certain."

A GOOD CHEAP BATH.—Mr. J. D. Long, in the *Western Photographic News*, gives the following:—"The following is my plan of making a glass bath, durable, cheap, and reliable. Select two pieces of flat glass the required size. Cut three strips of glass, an inch or more in width, for the ends and bottom of bath. Take the three strips of glass, and cement them together with pitch or rosin, and on a smooth piece of cast iron place some flour of emery and water; on this rub the edges of the glass strips until perfectly smooth and even and they are all of equal width. To put the glass together use a cement of glycerine and ground litharge, made thick as putty, and put on with a knife. Use wood clamps to hold the cemented glass together until dry. Make a tight wood box, about one inch larger than the glass jar, and suspend the same in it, leaving half an inch space on the bottom, sides, and ends. Melt good beeswax, and, being careful not to have the wax too hot, pour in around your glass jar until it is full, adding the melted wax as fast as it settles. When cold you have a wax bath, lined with glass, which will last you a lifetime."

To Correspondents.

TYRO.—Full details of Captain Abney's albumen and beer process appeared in our YEAR-BOOK for 1874. You will see there, on reference, that any collodion giving a fine, creamy film in the wet process may be used. Extra bromide may be added for special work, such as subjects in which there is risk of producing too much contrast, or for dense masses of foliage. As a rule, the plates do not require backing.

OLD MEMBER.—The whole thing appears to be a "cock-and-bull story," not worthy of attention. We have heard various versions of the story, and, on enquiry, we find that all are false or exaggerated. It was first stated that a printed circular for canvassing purposes was sent. That, we learn, is false altogether. Next it was stated that letters were sent out, written on paper with the official stamp or heading of the Society. That, we learn, is just as false as the former. Next it is stated that being so written created an impression that the letters were official, and that the late president wished Mr. Glaisher to be elected. The fact that no letters on the official paper were so sent out disposes of that notion; but, apart from that, it must be sheer nonsense to affirm that Mr. Spiller wished the election of Mr. Glaisher, seeing that he had not even nominated him, but did nominate another gentleman. It is rather an odd notion that one member is not to ask another member of the Society to vote for a special officer whose election he believes will be beneficial to the Society. 2. Mr. Glaisher was elected by the votes of considerably more than half the members who voted. The undesirable mode of dealing with the voting papers doubtless limited the number of votes recorded. The system of adding the votes recorded for one office to secure the election in another office appears to be open to considerable objection, and is, we believe, unusual. The election to which you refer was the result, we are informed, of the combined votes for two offices, either of which alone would have been insufficient to secure election. 3. No: better not.

W. A.—There is a photographic society in Bengal, and it issues a journal at intervals. Various photographic goods may be obtained in the bazaars, but there are no regular dealers in photographic goods. We send a great many copies of the *PHOTOGRAPHIC NEWS* to India. The price, free by post, is 17s. 4d. per annum.

H.—The committee in question have not rendered any report, and, so far as we can learn, have no intention of doing so.

VERTUOSO.—We have frequently described the process of fuming sensitive paper. We can only briefly indicate the method in repeating it in this column. Take a box of any kind—a packing-case will do—and line it with paper, to stop up all cracks and crevices; then place a saucer at the bottom containing (say) half an ounce of liquid ammonia. Pin a sheet of sensitive albumenized paper on the lid, face outwards, and close the box for ten minutes or a quarter of an hour. The paper will be then ready for the printing frame. Or, instead of fuming the albumenized paper, you may fume pads of blotting-paper, and place at the back of the sensitive paper in the printing-frame.

C. E. F.—By the "platinum printing process" we presume you mean the use of platinum for toning. It is not more to be depended on for permanency than gold toning. We have published formulas repeatedly. You will find some details in our YEAR-BOOK for 1871. We may here briefly indicate the method. A weak solution of the chloride of platinum is employed: say one grain in fifteen ounces of water. The free acid, always present, should be neutralized by the addition of carbonate of soda. This should be added until a slightly alkaline re-action is manifest, when a trace of nitric acid may be added, just sufficient to give a very slightly acid re-action. This solution will tone prints to a fine black.

F. T. TRULL.—Your cards possess some good qualities. There is a little too much front top light.

T. J. A.—The ground plan in your note indicates our meaning with one point of exception: the camera must be placed in the north-east corner, so as to be directly opposite the background. We think you will find fourteen feet wide enough for all purposes, and more convenient than a greater width. The YEAR-BOOK which contained a comprehensive article on glass-rooms, with illustrations, is out of print.

P. O.—In printing transparencies for the stereoscope on carbon you need have no trouble as to the proportions, &c., of the picture. Place a mask on the negative with aperture of the size and shape required, taking care to place it so as to include just that part of the negative you require. Cut your piece of sensitive tissue just the proper stereoscopic size, and place it carefully on the negative so as to bring the apertures of the mask in the proper position for the picture. Then, in mounting the tissue upon the glass for development, you simply take care to place the two evenly, edge to edge all round, and the image must be in its proper place. 2. A transparency for producing an enlargement should be deeply printed, delicate, and full of detail.

KATHERFELTO.—You had better apply to Mr. Meagher, whose announcement you will find in our advertisement pages. He is personally a practical worker.

NORTHUMBERLAND.—You will find much of the chemical information you require in Captain Abney's "Instructions in Photography." 2. If your images are so close together that you cannot cut out two the proper size, each including the proper amount of subject, the lenses should be separated a little more. The lenses should be about three and three-quarter inches from centre to centre, or even four inches. In cutting the prints, the right hand picture, when mounted, should contain just a trace most of the right hand side of the subject; the left hand picture of the left hand side. Of course, you know that the pictures should be transposed in mounting. The object of cutting the negative is to transpose the halves, so that the print may be produced and mounted without cutting in two for transposition. The print is pretty good, but it is not a picturesque view of the subject. 3. We are uncertain how long the sensitive carbon tissue sent out by the Autotype Company will keep. Much, doubtless, will depend on the weather. It will keep best in cold, dry weather, and worst in warm, moist weather.

ARCHER CLARKE.—We will take care that your suggestion is conveyed to the proper quarter, and something of the kind will probably be done.

C. A.—We cannot very well enter into a comparative description of the various lenses you mention here. The new one is, however, an unquestionable improvement upon the other to which you refer, by the same maker; and partakes more of the character of the third you name, by another maker.

S. W. L.—We have no means of knowing whether you could obtain a situation as assistant operator or printer. Your best plan will be, either to answer advertisements for assistants, which you will see in our advertising pages, or to advertise yourself. In either case you would have, in answering applications, to state details of your qualifications, and send specimens of your work. The negative in the specimens you send is slightly under-exposed and much over-intensified, so that the print is hard. As a print it is pretty good. For those who like black the tone is excellent.

DRY PLATE.—Considerable discussion appeared in our pages during last year on the subject of the beer to be used in the albumen and beer process. But as beer is not, in any case, an absolutely constant product, it is not possible to point to the product of any especial brewery as best for the purpose. We believe that Bass's pale ale generally answers well. Several Correspondents in our next.

The Photographic News, March 12, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE ARCTIC EXPEDITION—PHOTOGRAPHY AND NAVAL SCIENCE—ALBUMEN AND PIGMENT PHOTOGRAPHIC TRANSPARENCIES.

The Arctic Expedition.—Several of the officers attached to the Arctic ships the *Alert* and *Discovery* are being instructed in photography, with a view to their taking pictures of any natural phenomena they may meet with on their journey due north. At first it was intended that the knowledge should be acquired at some private studio at or near London, but the time is so short that rapid measures became necessary, and Captain Abney, R.E., has received instructions to put the naval officers concerned through a course of instruction at the Royal Engineer Establishment at Chatham. This is certainly the best thing that could have been done under the circumstances, and we doubt not that within a month the naval officers will be quite in a position to undertake such photographic duties as are likely to be required of them during the voyage. The vessels are being rapidly equipped at Portsmouth, and it is hoped that they will be out of the hands of the Dockyard officials during the first fortnight of April, so that there seems no reason why the expedition should not set sail by the middle of May or early in June. The outfit has been decided upon by a special committee of Arctic officers sitting at the Admiralty, Sir Leopold McLintock and Admiral Sherard Osborne, both well versed in such matters, being members of the body. The bedding sledges and Arctic tents are already made, and the provisions have for some time past occupied the attention of the officials at the Deptford Victualling Yard. A third vessel will accompany the two Government ships, a whaler, which the Admiralty at first thought of buying; and this is sent out at the joint expense of Lady Franklin and Mr. Gordon Bennett, of the *New York Herald*. This last-named vessel will be under the command of Lieut. Young, of the Royal Naval Reserve, and will in all probability carry Lieut. Franklin as a volunteer. Capt. Nares, R.N., who has given up the command of the *Challenger* expedition to take charge of the vessels proceeding to the North Pole, is engaged in getting together the necessary officers and crew, while the other officers are actively engaged in pursuing scientific studies of one kind and another. Thus while some of them are at Chatham profiting by Captain Abney's instruction, Commander Markham, the second in command, and three lieutenants, are going through a course of magnetism at the Royal Observatory at Greenwich, while two other lieutenants are occupying themselves with astronomy, and yet two more are being specially instructed to qualify them to take charge of the pendulum observations. Altogether it must be admitted that the expedition will be well qualified to undertake any duties of a scientific nature that may devolve upon it.

Photography and Naval Science.—The question of employing photography in connection with naval science, to which our French Correspondent recently alluded, is, as our readers are probably aware, not altogether new, although little has been done in this country in the matter. We are glad to learn from Mr. Batho's letter, in our columns last week, that the subject is one which has, however, not been altogether overlooked, and it would afford us much pleasure to be informed of the manner in which that gentleman proposes to make use of photography to record the latitude and longitude at sea. It is certainly an application of our art which should be useful to every captain, and if a thoroughly practical method were elaborated, there is no reason why it should not be adopted, at any rate in the case of vessels of size and importance. The use made of photography by the French Naval officers recently referred to by M. Lacan was to employ it

as a means of investigating the laws of oceanic storms, and as soon as the paper in question appears in the *Comptes Rendus*, or official proceedings of the French Academy, we shall have pleasure in placing a more detailed account of the research before our readers. An ingenious suggestion was made some years ago by an officer of the French Navy to make application of photography to show the course steered by a ship. A sheet of sensitized paper was placed in the binnacle underneath the compass, and this had a tiny hole through which the daylight penetrated; the sheet of paper was drawn along underneath the aperture, and became impressed, therefore, with a continuous line, and this line, as the vessel moved, indicated the course that the latter had been steered. Under certain conditions this plan was found to answer very well, but much care, obviously, was necessary in the arrangement of the apparatus, and, moreover, it could only be employed in the daytime. For these reasons no practical employment was made of this ingenious suggestion, which was, however, tried for some time by several masters in the French mercantile navy.*

Albumen and Pigment Photographic Transparencies.—We are glad to notice that transparencies other than the albumen prints of the well-known firm of Leon et Levy, of Paris, are beginning to make their appearance in commerce. It is certainly high time that such charming productions as glass photographs should have a far more extensive sale than has hitherto been the case, the celebrated French firm we have just mentioned having pretty well the whole business in their hands. These Paris pictures are world-renowned, and for many years they were unapproached by any other works of the kind, saving, perhaps, those of the late Mr. Breese, of Sydenham. It is time, we repeat, that other clever photographers, both in this country and abroad, should compete in the production of these charming transparencies, for it is, in fact, the only form in which photographs are done full justice to. Lastly, we have fancied—it may be only fancy—that pictures of this kind that we have had many years are scarcely so perfect now as when they were first purchased. The transparencies are still as sharp as ever, but, somehow, they appear more hard and glaring than formerly. In some cases the pictures are unpleasantly harsh and unnatural, although, we repeat, they have lost none of their sharpness or microscopic clearness. Whether this is due to our having lately become accustomed to transparencies prepared with pigment, and therefore of a warmer and more pleasant character than the albumen tone of the earlier pictures, or whether these are fading, to some extent, and hence are a little unpleasant to look at, we scarcely like to venture an opinion at present. But on examining, very lately, a large series of stereoscopic slides of this nature, we could scarcely believe but that they had parted with some of their original freshness and tone. In any case, however, if we can obtain pigment photographs of a pleasant tint, and as sharply executed as the albumen slides, the former will, we doubt not, be much preferred by the public, by reason of their more agreeable character. The price, too, of the albumen slides, as is well known, is a very high one, and this circumstance alone, we should think, would be a powerful argument on behalf of photographs of this nature being more abundantly produced than has been the case for many years past.

A PHOTOGRAPHER'S EXPERIENCES IN THE LIBYAN DESERT.

BY PHILIPP REMELE.†

It was my eyesight that suffered most in the sandstorm I had to encounter. A strong umbrella gave me the best

* It may not be generally known, by the way, that many of our ships now carry an officer skilled in photography, who has apparatus on board, and a dark room fitted up for his use between the decks.

† Continued from page 119.

shelter under the circumstances. The dry wind created also a feeling of great thirst, especially when it happened to be hot. You have to drink four or five times as much water as usual to quench the burning thirst. In our case, with hermetically sealed iron water boxes, there was no fear of any lack of water; but when, as is usually the case, it is carried in skins, a hot samoon will often dry up the liquid in a few days, and in this way cause a whole caravan to perish.

The so-called Chamsin, which is felt in April and May, is, in fact, nothing but the samoon, only there is this difference: that the former, which blows for about fifty days, comes from the south, and is invariably very hot. I felt its effects already in March, when I went out to take a few pictures with my camera. Although the wind was then very slight, and, owing to the dull atmosphere, the sun had little penetration, the interior of my tent had a temperature of 80° Reaumur. The chemicals would not act; a thick fog covered my plates when I developed them; and the silver bath, as glacial acetic acid was of no avail, had to be doctored. I made use of a plan which had previously been most successful, and added cyanide of potassium to my bath. It was then placed in the sunlight and filtered. The latter operation was, however, a tedious one. That day I had employed two donkeys to transport my effects; and as these animals are, in the desert, of very small stature, I had lightened the burden as much as possible, and the funnel was one of the things I left behind me. Under these circumstances I scarcely knew how to help myself, but at last I managed, by employing a good quantity of paper, to make a solid filter which I held in my hands until the liquid had passed through. After that I was not troubled with fogging any more.

That the pictures were not very brilliant may be imagined, but they could, at any rate, be used. To obtain some contrast between lights and shadows, I exposed for a short time only, viz., three seconds, with the smallest diaphragm of my aplanatic. The pictures developed very faintly, and required much intensifying; I had to keep in my hot tent for about a quarter of an hour with each of them.

A sudden samoon surprised me in the desert on the morning of the 18th January, as I was busy operating. My otherwise very stable camera-stand, to which the iron triangle of my camera was screwed, was thrown down by the powerful wind, and the camera broken against the hard lime rocks. A few negatives which had recently been taken, and which were upon a drainer on a flat stone to dry, were also exposed to the sandstorm, the sharp particles rattling against the glass. I tried to save them, but arrived too late, for the dry film was pierced with innumerable tiny holes. With my wrecked apparatus, and without any trace of my day's work, I had to make my way back through the desert, which never appeared to me so grey before. Out of curiosity I preserved one of the negatives which had been spoilt by the storm.

Arrived at Gasr Dachel, my servant, who during the storm had firmly kept hold of the tent ropes, and prevented the misfortune being more extensive, took the camera in hand, and by the next day had put it again in a serviceable condition. He turned out quite a practised mechanic. The hazel wood of one of the plate-boxes was used for the repairs. Fortunately the lens had suffered no injury, and the ground-glass was only cracked, and was easily patched up again, therefore. To the circumstance that in cameras of Meagher's construction the ground glass is not tightly cemented, but is held in its place by two easy springs, I have to attribute the fortunate preservation of my focusing glass.

During the time I was occupied in taking pictures in Dachel and the neighbourhood, I never had any days free from wind, and for this reason the depiction of landscapes in which plants and shrubs occurred was a difficult task.

The trees here (especially the ubiquitous date palm) shake much more than our more sturdy trees at home in Germany. For this reason it was that in no Egyptian pictures which I saw did I find the palm tree sharply rendered; and as this tree plays the principal rôle in every Egyptian landscape, such pictures are of little value. How difficult it is to portray the tree in a striking manner, many a painter knows.

The many acacias seen around Dachel, whose leaves and twigs are most small and delicate, as also the oil trees found in the vicinity of Farafrah, are excessively difficult to reproduce in the camera if the air is not perfectly still. I was fortunate, however, by biding my time and watching for opportunities, to secure some sharp negatives. In taking views of this kind, the main thing to be attended to is to see whether the foliage is really at rest or not. Many a landscape photographer believes everything to be favourable, and exposes his plate only to secure an unsharp image; and although I possessed many years' experience as a landscape photographer, this happened to me several times in the depiction of tropical acacias.

A peculiarity of this otherwise very dry country is, that the air often contains large quantities of moisture, which condenses as clouds, and which, on one evening in February, fell like rain, and continued for a whole day. I do not mean that a mere shower was falling, but there was a steady rain sufficient to keep everything wet out of doors, and make itself felt everywhere. Unfortunately, at this time, the roof of Professor Ascherson's room fell in with a loud noise; and had not the heavy downfall, which had set in at midnight, ceased soon after, our whole house, and perhaps a large portion of Gasr itself, would have been reduced to ruins. As everything is built of dried clay bricks, which fall to pieces as soon as they are thoroughly wetted, the worst was to be feared. Such a powerful rain as that to which I refer is, however, of rare occurrence. Trustworthy people told us that they had not known such a thing these thirty years.

During my sojourn at the Dachel Oasis, from January until the 15th March, I secured one hundred and fifty negatives—not a very large number for the time, perhaps, but then there was other work on my hands which absorbed many an hour and day of my time. Gasr Dachel was the headquarters of the expedition. It was my duty to fit out the caravans proceeding through the desert, and to receive and put in order those which arrived. All the post and provision caravans came here. It was no very pleasant employment that I had, for my work brought me in contact with the lowest vagabonds one could imagine. Wherever the drabs could cheat, they took an opportunity of doing so, and every request made to them had to be accompanied with a present of money. The black fellows returning with the empty trains and camels from the desert were exceedingly rebellious, and I had many a struggle in order to re-establish discipline; for as soon as they found themselves relieved from the personal supervision of the Great Man, as Rohifs was called, they became insubordinate. Nobody was more delighted than I, therefore, when at last my comrades returned from the desert in the middle of March, coming from Sinab by way of Farafrah. It was with much anxiety that their arrival was looked forward to, for as their journey had been protracted a fortnight beyond the specified time, and beyond the term for which they had taken provisions, and forage and water for the camels, it began to be thought that the caravan must have perished.

(To be continued.)

ART-CRITICISM.

BY W. NEILSON.*

To be in strict accordance with its title this paper should treat of the art of criticising art; but my aim is merely, by

* A communication to the Edinburgh Photographic Society.

making some general remarks bearing on the subject, to arrive at some particulars regarding photography.

Photographic societies do right in fully discussing the science of photography; but, if too exclusively confined to that, an impression may be made that the means employed are more important than the end to be attained. At any rate, our art lags behind our science. The necessity that lies upon photographers in general to study good pictures and the laws of art has already been well enforced here in the paper read by Mr. Mackay, and in remarks by Mr. Macbeth and others. I would add that it is also desirable that they should come to an understanding of what fine art is—its capabilities and limits, and its relation to the artist, the public, and the times; for a thoughtful consideration of such topics is suggestive of much that may enable the artist to take his true position. As my remarks tending in that direction must necessarily be concise, I have ranged them under separate headings in the hope of making them more distinct; and I cannot think that our time is wasted by having several evenings this session devoted to subjects bearing on photography as connected with fine art.

Science and Art.—On these two related yet opposed words the civilisation of the world turns; the one gathering in the abstract what the other embodies in the concrete. Lord Macaulay said, in his dashing way, that "every well-informed schoolboy has now more scientific knowledge than Sir Isaac Newton possessed." The reason of this spread of knowledge is evident. A few colossal intellects, looking into the secrets of nature, put them in formulæ to be handed down as heirlooms—centres of ever-increasing cumulation. Nothing of it is lost. And mechanical art, a child of science, has kept pace with its parent. The master-spirit lays his hand (say) on steam or electricity, and a thousand lesser men carry them into endless ramifications. Thus in our century we have, for instance, the kingdom lighted with gas, steam navigation, the spinning jenny, the locomotive, the tubular bridge, and the stretched wire that carries our whispers to the ends of the earth. But, observe, this kind of art can be fixed in formulæ, as measured by the yard or pound, and handed from generation to generation with the certainty of still increasing. Nothing of it is lost. But what of fine art? It is wholly different. Raphael, Shakespeare, and Beethoven cannot bequeath the secret of their working to be carried on by others. We cannot say here nothing of it is lost. The master-spirit dies and the oracle is dumb. Fine art, then, differs from other art in this—it cannot be measured to be put in formulæ. Its appreciation depends wholly on a certain endowment of the artistic faculties.

Taste.—When the artistic faculties are directed on a subject they arrive at a certain judgment concerning it; that judgment is what I mean by "taste." It follows that the more perfect and duly balanced these faculties are the more perfect will the resulting taste be; but the kind of criticisms generally pronounced on works of fine art lead us to fear that these faculties have, generally speaking, no great development. In fact, good taste is very rare. The capable critic views a picture in its totality—the design, the composition, the execution, and the result of the whole—and the conclusion he arrives at—that is, the expression of his taste—will be good or bad in proportion as his faculties are well or ill balanced.

But the general community pursue quite a different line. They are apt to judge of a picture either solely by the subject it represents, or, if they have an extraordinary endowment of our common inheritance, vanity, they will pick you out before you can wink what they call a fault, and depreciate the artist by way of exalting themselves; or their admiration is wholly devoted to details. Their limited vision can see nothing in a picture but the clear, brilliant details:—"What a pretty boy!" says the old lady. "Oh! that darling of a dog!" cries the girl. And "How very clearly the twigs of that tree come out!" quoth pater familias. If any one doubt that such is the common

run of art-criticism, he can easily put it to the test. Let him take a dozen or so chance companions, not artists, of course, one at a time, to see some pictures, concealing the names of the artists, and if he be not amused and amazed at the remarks he hears it is probably time for him to think of weighing himself in the balance.

As a sample of the world I shall give a *bona-fide* experience. Last autumn I visited the Smith Institute, in Stirling, which contains an excellent collection of several hundreds of ancient and modern paintings; among others a "Murillo," lent for exhibition by Sir William Maxwell Stirling—probably the finest "Murillo" in Britain, and certainly not surpassed in our public galleries. During my three visits of several hours each I saw only one individual stop to look at this exquisite painting. Out of curiosity I took note of what were the chief objects of attraction; and I am sorry to say they were not the best pictures. "Distinct twigs," "Darling dog," and such like details carried the enthusiasm. And these people were not mere benighted natives; they were mostly tourists, English ladies and gentlemen, kindly stopping to patronise provincial art, on their way to the Trossachs to patronise provincial nature. It reminded me of the long ago, when a *daft* man, a tourist in his way, in a pair of red whiskers, walked and re-walked all day about the Brig o' Turk, with a thrust-out hand, demanding a penny in a Gaelic shout; I, like a boyish Samaritan, offered him a shilling, which put him in such a fury that my discretion got the better of my valour at the rate of eight miles an hour. So sad, to see people prefer copper to silver, whether at the Brig o' Turk or in a picture gallery! The conclusion I wish to state is that the taste of the general community is almost wholly confined to details, and that their opinion of works of fine art is of no great value, to say the most of it.

Details.—The passion for strikingly, staringly graphic details is so universal that it may take rank among the "signs of the times." And it is not a bad sign, in so far as it indicates a spread of intelligence in the community, not capable of comprehending a subject in its totality, but still sufficient to take an interest in it. Yet this very proof that there has been some advance measures how small that advance has been. It is self-evident that when a subject, which has been restricted to the smaller circle of intellects trained in that department, is to be brought before the general community who have not been so trained, it must be presented in a different aspect, and the abstruse and ideal must be interpreted simply through their details. In other words, to suit the populace they must suit the popular comprehension and taste. A kind of deterioration inevitably takes place.

In literature we find how this has taken place, as the circle of readers widened throughout the community. Themes which were formerly confined in tough volumes for the learned trained in that department are now broken into details for the popular magazines. The solid style of Hume's *History* has given place to the brilliant details of Macaulay. The thoughtful novels of Fielding have gradually degenerated into the endless details of Dickens. Dickens, with all his genius, wonderful invention, power of individualizing, broad humour, and sentimental pathos, was chiefly indebted to his endless and unequalled power in graphic details. Fortunately for his unrivalled popularity, he had no faculty of generalizing. His whole works were made up of details and details. His successors, with rare exceptions, in poverty of genius follow the path in which he triumphed, and get their novels read by stuffing them with details, especially of furniture and dress—said to be dear to the better half of humanity—and with descriptions of Nature, which, fortunately, she cannot hear. No poetry is popular now unless it is choke-full of pretty details. The giants are out of date; Shakespeare himself has become heavy, and Milton decidedly dull. The argument might be strengthened by considering the theory of what is called the music of the future. Architecture pays more attention to

details than to proportions. And what of art? Has it withstood the tide of this popular demand? No, it has not.

Fine Art.—The central principle of fine art is the same, whether embodied in poetry, painting, music, or other mode. It has one soul, so to speak, but different bodies; always the same thing embodied, whatever the instrumentality may be. It may be considered as having two departments, which, for distinction, I shall call the "higher" and "lower" platform. When a picture gives details so as to represent its subject without carrying you in *feeling* beyond it, it is a work of art on the lower platform. When a picture gives the necessary details of its subject so as to carry you beyond it, rousing the vague impressions that are left in us by the experiences of life, so that we have a feeling of the universal, it is a work of fine art on the higher platform. De Quincy, in one of his works, talking of grand music, says: "It dilates the heart into a capacity for the infinite." This is the same idea. He does not say that it suggests grand ideas, and excites the imagination: of course it does that, as almost anything may do—even the grunting of a pig, or the most wretched daub; but, *as fine art*, it expands the heart, rouses the emotional impressions of our being, boundless, infinite—a feeling of the universal. And thus it ascends from art, the lower platform, into fine art, the higher platform. Fine art includes art, and what it embodies will excite the imagination, as any work of mere art will; but *as fine art* it appeals directly, as its chief function, to the highest part of our being—the emotional—in which are hived the impressions of our lifetime. To put it in a figure: the emotional is the bank in which we hoard, and from which we draw out the precious wealth of life, and "thought" is merely a porter at the door, pointing the way and keeping things in order. Fine art does transact with the porter at the door, but only in order that it may pass on to draw out the inner wealth of the bank. Art never gets a step or two beyond the porter.

In the palmy days of fine art there were comparatively few painters—men whose innate genius impelled them to the work—and they had the advantage of working for a comparatively limited circle, and not the general community, who received their Madonnas, and the like, only as symbols of religion. In our later times, as the demand for books increased, under the auspices of the march of intellect, so gradually arose a demand for pictures; and academies of art were instituted to meet the demand, and elevate the public taste, if they could. Let us look at this idea in the glass of another fine art. What would have been said of academies proposed to train men to become poets? The idea would have been received with more than a little laughter. Yet you might turn out a thousand men per annum to write the pretty sort of verses generally found in magazines, which are appreciated by the general public just because they suit their taste, being full of details and little else. In fact, your men would be poets in everything except "the vision and the faculty divine." You could not expect them all to be Homers.

Now, let us turn the idea back to the academies of art, and ask: "If you cannot train men to be poets on the higher platform, can you train men to be painters on the higher platform?" The answer must be the same in both cases—No! You may teach them the art of drawing, colouring, and composing, in so far as that can be taught, and they will turn out pretty pictures of all shapes and sizes; but you could not expect them all to be Raphaels. Britain, like other countries, has its few pre-eminent painters, and many more of eminence, whose position would have been the same if academies of art had never existed. I do not allude to these, but to those who could never have been artists but for their training in an academy. Unable to reach above their height, these men necessarily remain on the lower platform, devoting themselves to the art of giving what Sir Joshua Reynolds calls "the punctilious delineation of details." When you consider that this style of painting is that most appreciated by the general community, and also

the great number of men who produce such pictures, you see at once how the demand and supply fit into each other, and how the appetite for details is fed, and how such feeling increases the appetite. In fact, such has become the rage for brilliantly-graphic details, that even men who might achieve higher work are found accommodating themselves to the popular demand of the day. The public is the great patron now, and it is to be feared that the noble idea of the artist elevating the patron's taste may be resolved into the patron giving law to the artist. The pocket with the cash in it commands the situation.

These remarks are not intended to disparage the thousand artists of the day. They fill their place, do their work, and meet the public demand. They produce very pretty and pleasing pictures, that give delight to thousands; and the skill they, as a body, have acquired is quite wonderful. It is admitted now that there is a Scotch as well as an English school of painting of high standing, and the nation has reason to be proud of both. The annual exhibitions in Edinburgh, no less than in other places, show not only that there is a general excellence in manipulation, but that many artists have a feeling of fine art, which would probably be more pronounced if they had not to suit the public taste. On the whole, these exhibitions have, no doubt, to a certain extent, a refining and elevating effect on the public; yet not of the loftiest kind. Pretty detail and high finish are too much the rule; and there is too little evidence of the simple greatness which results from a high aim and a lofty habit of contemplation.

(To be continued.)

CAMERA FOR LANDSCAPE WORK.

BY DAVID AIRD.*

WHILE the resources of landscape photographers have received valuable additions in those varied dry processes which have been perfected during the past few years, to those especially who only practise our fascinating art in their hours of leisure and relaxation, the ease and certainty with which dry plates can now be prepared render them a boon which cannot fail to be felt and appreciated; but it is a curious fact that the more we advance in improvement, the more we feel how much may yet be done.

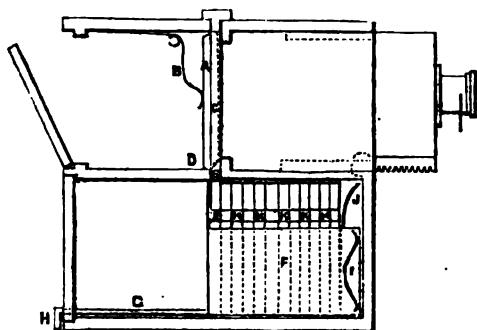
To workers of the wet process, the usual arrangement of camera and dark slide appears to be all that can be desired; but when we take an excursion into the country with two or three dozen of dry plates, the number of slides necessary for their accommodation form a fruitful cause of inconvenience and vexation. The apparatus best suited for the use of the tourist must be compact and complete in itself, strong to withstand hard knocks, and not liable to get out of order.

The camera which I have brought before you to-night has, I think, at least those three good qualities; it measures 8 by 8½ by 5½ inches, but as it was intended for experimental purposes, I only made it to contain plates 3½ by 4½; it holds one dozen dry plates, but could be made to accommodate fourteen or fifteen.

It is, as you will see from this drawing, divided into two compartments, the upper one being furnished with a lid on one end, and having a sliding front with rack adjustment for carrying the lens; this part might be made with a bellows body, or any other arrangement for lengthening the camera usually adopted by camera makers. In the centre of this upper compartment is the focussing screen A, held forward in its place by the two springs BB; the slide for raising the plates is an open frame, being simply two slides of brass, C, one passing down each side of the focussing screen and joined by a round cross-bar D, at the bottom, a short distance from the end. The end of each strip of brass is furnished with a small projection, E, the use of which we shall presently see. In the under com-

* Communicated to the Edinburgh Photographic Society.

partment, which is designed to hold the prepared plates, is a box, F, one-half the length of the compartments, and capable of slipping from one end to the other, and moved by the slip of brass G, which projects to the outside at H;



into this box are placed one dozen slender frames for holding the prepared plates, and which are all pressed together by a spring, I, in the end of the box, where there is also a shifting end with its top edge sloped off, as at J; along the sides of these frames there is run a groove, K, into which the projections on the ends of the slide loosely fit.

The manner in which the apparatus works is this: after having selected and focused your view, the door at the end is shut, so as to exclude the light, and on raising the slide it brings with it that frame, with its prepared plate, which is at the one end of the box. The round bar on the slide acting on the under side of the focusing-screen, which is sloped off for that purpose, pushes it back, and the plate occupies its place instead. After exposure, the brass slip is pulled out, when, on pressing the slide down again, the frame acting on the sloped edge of the shifting end, pushes it back, and is received into the other end of the box from which it was taken. On pushing in the slip again, the frames with the plates all go through between the projections on the end of the slide, except the first one in the box, which will be brought up next time the slide is raised, and so on until the dozen are all exposed, all that is necessary being to keep a memorandum of the number of plates which have been exposed. Again, by having this brass slip divided into the same number of spaces as the frames occupy in the box, you can select any one you please from among the plates, instead of taking them by rotation. For example, if 1, 2, 3 are one kind of plate, and 4, 5, 6 another kind, if you wish to expose 4, by pulling the slip out to the fourth division, and then raising the slide, you bring up that plate; but then it must be kept in mind, for future operations, that 5 and 6 will have slipped forward, and will now occupy the place of 4 and 5.

I ought to have stated that the space behind the focusing screen is very useful for packing away the lenses or other small articles in. I have no doubt that this apparatus may be much improved upon, but I must say it has thoroughly fulfilled all my expectations.

A NEW PLAN OF PREPARING TRANSFERS FOR MECHANICAL PRINTING.

BY M. L. BORLINETTO.

I COVER a well cleaned glass plate with oxgall, which may be made to keep a long time on the addition of creosote. With the help of a bit of woollen rag I gently rub the surface of the glass in such a way as to distribute the oxgall evenly over the surface, without leaving any lines. I dry at a gentle heat, and while the plate is still warm I place it

on a levelling stand. In the meantime I prepare a solution of gelatine made up of—

Gelatine ...	...	...	5 grammes
Water ...	...	...	50 "
Rock alum ...	...	...	1 gramme.

This is thoroughly filtered through a bit of flannel after the gelatine and alum have been dissolved. While it is still warm, I pour it upon the plate treated with oxgall, and if the gelatine does not spread well I assist matters with a strip of cardboard. I then take a sheet of white paper, rather strong, and this I immerse in a dish of water, and when perfectly moistened it is drained by pressing against blotting-paper. The sheet is stretched over the gelatine, having a care that no air-bubbles arise, and that no gelatine gets on the back, and is left in this position till the next day. If the weather is not too damp the paper covered with gelatine separates from the plate of itself, but should this not be the case the margins are lifted by means of a penknife. The surface of the sheet is of a most brilliant nature, and may be kept in this state for an indefinite period.

When I desire to make use of it I plunge it into a three per cent. aqueous solution of bichromate, and suspend it to dry, after which it is exposed under a negative. As soon as the image appears in all its detail I plunge it in a solution of—

Nitrate of silver ...	...	...	1 part
Alcohol ...	...	...	20 parts
Water ...	...	...	50 parts

The surface then becomes of a brick-red, in consequence of the formation of chromate of silver. I wash with pure water, and then throw over the image some liquid ammonia diluted with three times its volume of water. Under this reaction the red tint disappears (chromate of silver being soluble in ammonia), and there remains an image of a pale greenish tint, formed of oxide of chromium. After this transformation I wash again with water, and place the picture (face uppermost) upon a hard board, very clean, to which it is fixed with drawing-pins. A dry and very clean sponge is now passed over the surface, and in this way the excess of humidity is removed from the surface, after which the image is inked up by means of a lithographic roller.

The advantage of this process over those with which I have hitherto experimented is, that the ink attaches itself immediately to the impression, even when it has been over-exposed, and that one never gets reverse images, as is the case in other methods, when the undecomposed chromium has not been eliminated. The gelatine, by its association with alum in the first solution, and its immersion in the bichromate of potash bath, becomes perfectly insoluble, its consistence being argumented by the effect of the silver solution.

TO RESTORE OLD COLLODION.—Mr. R. A. Robinson says, in the *Western Photographic News*:—"To a pound of collodion add two pounds of water; shake thoroughly and let settle, when the cotton will all precipitate. The ether and alcohol being on top may now be decanted, and the cotton obtained from the water by straining through a piece of muslin. There will be a trace of water in the alcohol previously decanted, which may be removed by adding a little unslacked lime, and allowing it to stand a day or two. The cotton you have obtained mixed with an equal quantity of new, makes a fine soft working collodion. The ether and alcohol after above treatment may require the least quantity of acid. For this purpose, take one drop of muriatic acid, and add to one ounce of alcohol, shake up and add a drop or two to your collodion. It may also be necessary to add new excitants. Filter the solution carefully to remove the lime. Should any of the lime remain in suspension, it will in a short time precipitate in the form of a white powder. Old and apparently useless collodion treated in this way I have found to work equal to or better than new."

The Photographic News.

Vol. XIX. No. 862.—MARCH 12, 1875.

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A NOVELTY IN PORTRAITURE.—BOUDOIR PORTRAITS.

REGARDING portraiture in its business aspects, the introduction of a novelty calculated to give an impetus to demand must always be interesting to professional photographers. We have to introduce to our readers a new style of portrait which cannot fail, we think, if judiciously brought before the public, to secure general approbation, and create a new demand for photographs. The idea of the new style is due to Mr. Valentine Blanchard, who has felt the need of a popular style of picture, for production and circulation in large numbers, like the card and cabinet portraits, but larger and more important than either. The size should be sufficiently important to do full justice to modern costume, without being so large as to interfere with the existing demand for large sizes, such as ten by eight and upwards, intended for framing. It should also possess symmetrical proportions, well fitted for doing justice to full-length standing figures—a style generally satisfactory, as permitting flowing draperies to be fairly rendered.

All these and various other desirable points are secured in the style which Mr. Blanchard recommends to his brother portraitists, as worthy of public favour, under the name of the "Boudoir portrait." The size of the print is seven inches and a-half by four inches and three-quarters; the size of the mount is eight inches and a quarter by five inches. It will be seen that this gives precisely the same proportions as a card picture, and is, in point of fact, exactly the size of four card pictures. A narrow margin of mount, one-eighth of an inch wide, is left at the top and sides, and half an inch at the bottom, after the usual mode of mounting card portraits. The effect of a fine photograph in this style is singularly attractive and imposing, and must, we feel satisfied, take the public fancy at once. It will probably be difficult to secure uniformity in price; but there may be, at least, a uniform principle in charging. Mr. Blanchard charges, for half a dozen of the new style, two guineas, which is just twice his charge for the same number of cabinets. As each picture is just the size of four card pictures, it will be wise to make four times the price of cards the minimum charge, especially as the larger size will make a greater demand on the artist's resources to produce a perfectly satisfactory result.

The most effective subject for the new size will be found full-length figures of ladies in modern fashionable costume, to rendering full justice to which the boudoir portrait especially lends itself. The head in such a picture is about an inch long, or somewhat less than that. Three-quarter

lengths, vignetted, are singularly charming in this style, and may probably in many cases involve less trouble in production. The proportions of the picture are, as it will readily be seen, admirably well suited to pictorial purposes for full-length and three-quarter length figures, being as nearly as possible the same proportions employed by Gainsborough, Sir Joshua Reynolds, and other distinguished portraitists in painting a similar class of portraits. The shape of the picture relieves the artist of the necessity of filling up a vast space of background at each side of the figure, often a trouble in wider shapes, whilst it furnishes facility enough for the effective introduction of a few suitable accessories, or a little suggestive sketchy landscape effect. Another possible advantage of the proportions necessary in the figure, but an advantage which it will be wise to use charily, is the possibility of printing cabinets, or even cards, from the same negative where they are imperatively required.

An important question will arise in the minds of portraitists as to the mode of launching such a novelty. Fortunately, facilities for this are already provided. Messrs. Marion and Co., of Soho Square, have already manufactured albums, cases, frames, mounts, and all aids to placing the boudoir portraits before the public in a complete form at once. Portraitists know well the importance of such aids to launching a new style. A complete set of specimens in mounts and frames, in cases and albums, have a much more important and attractive effect than two or three isolated examples scattered about. A sitter induced to try the new style, and to purchase an album, will at once stimulate her friends to sit for similar portraits to fill her album. The new size will not involve any serious mechanical difficulties. A whole-plate lens will serve admirably for producing such portraits, and a ten by eight plate, used with a camera with repeating-back, will serve perfectly for two negatives side by side, and so admit of printing in a ten-by-eight printing-frame.

We commenced our remarks on this novelty by referring to it as possessing primarily a trade interest; and this is a form of interest which even the most lofty-souled artist should not affect to despise. Every art and every science in existence has its relation to such interests. One great aim of the tradesman whose ambition never soars above the shop is to stimulate the market, to create wants, to induce the public to buy not simply what they absolutely want, but things which, although they really do not require them, they may be well enough pleased to have when once a desire for them has been awakened. In many important branches of trade a constant change in fashion is of set purpose secured, in order to keep up an equally constant demand for novelties. Mere wear and tear of an ordinary kind in the goods they supply would not maintain the trade, and hence the demand must be stimulated by the desire for change, which is initiated by changing fashions. To those who look at the matter in a strictly business light, a taking novelty will at once recommend itself; and to those who are unwilling to regard their profession as a trade governed by trade influences, it may be easily shown that arguments closely analogous are as applicable to the art as to the trade. One essential function of art is to create wants: its first and most essentially educative operation is to stimulate a desire for something higher than the bare means of living. "Allow not nature more than nature needs; man's life is cheap as beast's." The mere means of living supplied, bare food for the body provided, the art instincts begin to assert themselves, the refinements of life are desired, and every advance in science and art creates as well as satisfies some higher taste or aspiration. Photography itself is a notable example. Portraits of beloved friends have become almost a necessary of life in every home, from the palace to the cottage; whilst a little more than a quarter of a century ago the portrait was a comparatively scarce luxury, which it never entered into many minds to desire to possess. Every good

novelty in photography is, then, worthy of the attention of all professional portraitists, whether their primary aim is to push a trade, or to work out one of the functions of art by creating and satisfying refined tastes and aspirations.

ANOTHER NEW STYLE.—IMPERIAL PORTRAITS.

In the preceding article we describe the novelty in portraiture which Mr. Blanchard has recently introduced under the name of the Boudoir Portrait. We have just received a series of very charming specimens from Mr. Abel Lewis, of Douglas, Isle of Man, produced in a style which he names the Imperial Portrait. It is practically a whole-plate portrait, mounted with a narrow margin, card fashion. To be precise, the prints are just eight inches and a-half by six inches and a quarter, and the mounts, which are of buff cardboard, are ten by seven inches. The portraits are chiefly three-quarter lengths, and are probably printed from ten by eight or even larger negatives. In some cases the portrait is printed in a circle, with a grey margin. This plan is adopted with children, and is very effective and pleasing. As examples of art photography, we have rarely seen anything more charming than these pictures. Placing them side by side with the Boudoir Portrait, they are so distinct in size and effect that they need not clash, and may both fairly take the public taste, although, for a large run, it is probable that the Boudoir style will be best suited. Mr. Lewis has found the Imperials a success beyond his anticipation, and he has not found it interfere at all with the demand for larger sizes, but, on the contrary, to act as feeders, if we may use the term, to the taste for larger work. Mr. Lewis states that he has long felt the need for something larger than the cabinet, in a similar style, and hence he adds independent testimony to that of Mr. Blanchard, to the effect that an opening for a suitable novelty or novelties exists. Mr. Lewis has already published some studies in the style which have at once taken with the public, and sold largely. Many other leading photographers in the North are already adopting the Imperial size, we understand.

There is, perhaps, a slight disadvantage in the fact that the term "Imperial" has already been employed by some photographers in America to designate the cabinet portrait; but as it is manifestly unwise to use a new name for a familiar size, we may fairly leave the error to correct itself, and adhere to the use of the term Imperial to describe the noble size which Mr. Lewis has introduced.

TRANSIT OF VENUS.

We are indebted to Mr. J. Smale, of Dartmouth, for a brief note on the operations of the observing parties in the south. Two of the gentlemen in charge of the photographic observations of the American party, being passengers on board the *Edinburgh Castle*, which put into Dartmouth after a rapid passage of twenty-four hours from the Cape, handed the note in question to Mr. Smale, who has been good enough to forward it to us for publication.

EDINBURGH CASTLE, March 5th, 1875.

The Several Expeditions at Kérquelen, 49° S., 71° E.—The expeditions were successful. The American party observed ingress, and obtained sixty-five negatives with Venus on the disc of the sun.

The English Expedition.—An extract from Father Perry is as follows:—"We were fairly successful on December 9th, having obtained a first-rate observation of ingress at one station, and a very good one of egress at another. Egress was fairly observed at our first station. Photography has not been a success with us."

The German Party.—The Germans were fairly successful, obtaining a first-rate observation and about sixty negatives.

The American party left the island on 12th January. The voyage to the Cape was very pleasant. The party then separated, part remaining on board the man-of-war *Monongahela*, and will go to Rio Janeiro, Brazil; and the rest coming to England, and then home. The parties left on the island were well.

G. W. DRYER, } Photographers to
IRVINE STANLEY, } American Party.

MOTTOES FOR PHOTOGRAPHERS.

BY O. G. REJLANDER.

[THE following mottoes, selected as applicable to photography and photographers by the late and lamented O. G. Rejlander, will interest all our readers. We are indebted for them to Mrs. Rejlander, who, having recently found them amongst her late husband's papers, knew that they would interest us, and kindly placed them in our hands.—ED.]

- 1.—TO AN OPERATOR.
"She who hesitates is lost."
- 2.—TO A PRINTER.
"Make hay whilst the sun shines."
- 3.—TO A TONER.
"Let not thy left hand know what thy right hand is doing."
- 4.—TO A RETOUCHER.
"A stitch in time saves nine."
- 5.—TO A SPOTTER.
"Keep within bounds."
- 6.—TO A MOUNTER.
"Act on the square."
- 7.—TO A PUBLISHER.
"Live and let live."
- 8.—TO A PURCHASER.
"A labourer is worthy of his hire."
- 9.—TO A CRITIC.
"Ne sutor ultra crepidam."

FRENCH CORRESPONDENCE.

A SUBSTITUTE FOR RETOUCHING—REPRODUCTION OF ENGRAVINGS AND HALF-TONE—THE PHOTOGRAPHIC MANSIONS OF PARIS—M. LIEBERT'S NEW FRANCO-AMERICAN STUDIO.

I HAVE just received from M. Hassan, a photographer at Oran, a letter, in which that gentleman describes a method of dispensing with the retouching of negatives. The whole of the method consists in interposing between the negative and the prepared side of the sensitive paper during printing a light tissue, like crape or gauze, such as dressmakers make use of. The exposure is conducted in the ordinary way, only that from time to time, when viewing the progress of the print, the tissue, which is elastic, is stretched, and the thread or network, changing its position, contributes to render the result very soft and delicate. In the case of large plates, such as one is obliged to print in big frames, closed by three or four covers, the tissue may be changed or removed altogether, after the printing has gone far enough for your purpose, leaving the impression, during the last period of its sojourn in the frame, in direct contact with the negative film. The author of this communication recommends especially the employment of a good varnish upon the clichés, and recommends that the operator should assure himself of the same being perfectly dry, so that there is no chance of the tissue adhering to the same. One need not fear that the dark shadows will lose their brilliancy—or, at any rate, that the prints will be produced of a grey, blunt character—for if the tissue

in a strong solution of iron (I used old developing solutions) till the film is saturated. They should be now well washed and again immersed, this time in a bath of a saturated solution of gallic acid. It is well known that a mixture of gallic acid and iron in solution forms ink. In this case the film is first impregnated with iron, and then converted into ink upon the application of the gallic acid, and if, on examination, it is found that the negative or positive is not sufficiently dense, the same process can be repeated again and again, taking care each time to thoroughly dry before immersing in the iron bath.

They say "Out of evil comes good;" and if I had not read in the last week's issue of the *News* the article in which you state that Mons. Lambert had patented a method of intensifying carbon negatives, I certainly should not have thought of giving publicity to mine.

Trusting that this wee bit of information will find a welcome place in the columns of your valuable journal—I beg to remain yours obediently,
CHARLES WHITING.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual monthly meeting of this Society was held on the evening of the 9th inst., in the Architectural Gallery, Conduit Street, Mr. J. GLAISHER, F.R.S., in the chair.

THE CHAIRMAN said that somewhat unexpectedly he found himself again in the position of chairman amongst them. He would simply express a hope that all their proceedings would be characterized by unanimity and a general aim to secure the advancement of the science.

THE SECRETARY read the minutes, which were confirmed, and Captain Verney was elected a member of the Society.

CAPTAIN ABNEY then read a paper giving details of his photographic experiences in connection with the transit of Venus observations in Egypt, which will appear in our next. Some examples of negatives and transparencies were shown in illustration of remarks in the paper.

Some conversation followed, in the course of which Captain Abney stated that the temperature during which his photographic operations were conducted ranged from 40° to 90° Fah., giving a difference of 50°. He had found the dry and wet bulb of great value, as often indicating the probable exposure required.

THE CHAIRMAN expressed the great interest and pleasure with which he had listened to the paper, and proposed a vote of thanks to Captain Abney, which was carried by acclamation.

MR. F. YORK exhibited, by the aid of the magic lantern, a view of the station with photographic and astronomical erections used by Captain Abney at Thebes, and some negatives of the transit, taken by Mr. Bruton at Cape Town. After a vote of thanks, the meeting having been made special.

MR. HOOPER moved the resolution of which he had given notice, to the effect that payment of subscription for the past year be taken as a qualification for voting, in place of the offensive rule which had been recently put in operation, making payment of subscription for the current year imperative before voting at annual elections.

CAPTAIN ABNEY seconded the resolution.

COL. STUART WORTLEY objected that the special meeting was not properly called according to the rules, which required it to be called by the council, or on the requisition of twenty members, and that notice according to the rules had not been given to every member.

THE SECRETARY explained that the special meeting was duly announced by the president at the last meeting, and due notice had been given in the *Journal* to every member.

A long desultory and irregular discussion followed on various points, in which Mr. Bird pointed out that the proceedings were perfectly in order, and in accordance with the rule. He did not agree with Mr. Hooper's motion, but contended that he was perfectly in order in bringing it forward, and the meeting was competent to deal with it, as it would be with another motion, of which he intended to give notice.

MR. STILLMAN believed the meeting to be irregular and out of order. He was proceeding to point out that the Society was altogether disorganised and in a muddle, with rules drafted, accepted, broken, and misunderstood, but was interrupted by cries

of order from the body of the meeting. After more desultory conversation, in which Mr. Hooper, Col. Wortley, Captain Abney, Mr. Bird, Mr. Stillman, Mr. Spiller, the Secretary, and the Chairman took part, Mr. Hooper's motion was put to the meeting and carried.

THE CHAIRMAN said that the vote showed the feeling of the meeting; whether it possessed a legal value or not he could not say until he better understood the rules, which having been made during his absence, he was not prepared at present authoritatively to interpret.

The proceedings then terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of the Society was held in the Bible Society's Rooms on the evening of Wednesday, the 3rd inst., the President, Dr. THOMSON, in the chair. The minutes of the previous meeting, and the minute in connection with the death of the late Mr. O. G. Rejlander, were read and approved; and the following gentlemen were admitted ordinary members: Messrs. David Small and Thomas Davidson.

MR. W. NEILSON read a paper entitled "Art Criticism" (see page 122), illustrated by several fine large and small photographs.

THE PRESIDENT congratulated Mr. Neilson on the admirable and exhaustive paper which he had read. The paper was one of great value, and showed that he was thoroughly at home in the subject, and that he had given it much study. It had been said that artists were born, not made; but even genius required education, and he thought the present generation enjoyed greater advantages than their predecessors, in so far that if one only brought his powers of observation into play, it was impossible to walk along the streets without finding material for instruction. He could remember the time when there was no gas in our streets, and when the shop windows were required for light, and not for show; now, however, matters were very much reversed, and we had in the windows of the print-sellers, the furniture dealers, and the china shops, a constant changing series of museums of art, or art galleries, that were daily exercising an abiding influence on all who cared for such study.

MR. NORMAN MACBETH was very much pleased with the paper just read, and especially with the pictures by which some of Mr. Neilson's views were illustrated. He was, undoubtedly, working and writing in the right direction, and both pictures and paper went far in corroboration of what had been said, and strongly maintained, on a previous occasion.

MR. MACKAY had great pleasure in listening to the paper just read; especially was he pleased with Mr. Neilson's observations on fine art, which did not consist of minute detail, but in a proper working up of the ideal. This, he thought, was well shown in Mr. Neilson's pictures, which he did not hesitate to say were equal to anything of the kind that had been produced in Scotland.

MR. ROSS agreed with the greater part of Mr. Neilson's paper, which he considered an able production. Much indeed depended on development, and he might say that where it was desired to produce texture, the least possible quantity of silver should be employed. More than twenty years ago he had read a paper before the Photographic Society of Scotland on this subject, and had at that time developed with gallic acid alone, without a particle of silver. He thought it might be held as axiomatic, "the less silver, the more texture."

MR. NEILSON said that there was less need for silver in intensifying than was generally supposed. He found that, after fixing, he could get a considerable increase in the intensity by the application of iron alone.

MR. DAVID AIRD then exhibited, and read a short paper in explanation of, a camera for landscape work so arranged that, without dark slides, a dozen plates might safely and certainly be exposed in any required order. (See page 124).

MR. TURNBULL understood that there had been a camera patented—he thought by Cook—having the same object in view. He had not seen it, but, from what he had heard, he believed that the one now on the table was in certain respects much more convenient and certain in action. One great advantage he considered to be the power to take the plates in any order, and that so easily and certainly that a mistake seemed impossible. Another important point was the fact that the camera contained in one piece everything required, so that nothing could be either lost or forgotten.

DR. JOHN NICOL thought Mr. Aird deserved much credit for the perseverance and labour which must have been expended in having (unaided) produced such a complete result. So far as he

KEEPING QUALITIES OF THE PELLICLE EMULSION.

BY WILLIAM ATKINS.*

In accordance with a promise made at our last meeting I now wish to make a few remarks on the keeping qualities of pellicle emulsion prepared by Mr. W. B. Bolton's process.

It will be remembered that at the April meeting of our Association last year I exhibited two transparencies produced by means of this process—one of them upon a plate prepared the previous January, the other upon a plate made from the same batch of emulsion used on that occasion, and which had in the meanwhile remained in my possession untouched, being at the time eighteen weeks' old.

A few evenings since I again tried this old emulsion, and the results are now before you. The conditions observed were as nearly as possible similar on each occasion, the same negative having been used and the same exposure to gaslight (ten seconds) given. No gold was used for toning. The results, upon comparison, are as good as the previous one. The emulsion has not deteriorated in the slightest degree. A slight opalescence is observable upon drying the plates, but this may arise from the ordinary decomposition of the pyroxyline, which takes place with even plain collodion; or it may be caused by some chemical action traceable to the organic matter used in the emulsion, which, in this case, consisted of tannin, soap, and sulphate of quinine. The latter substance has since been found to exercise a very powerful effect as a restrainer, and it is very probable that its action does not stop there.

The plates prepared from this particular emulsion exhibit now, as previously, a tendency to slowness in development, but in that respect are in no way different to what they were thirteen months since, thus proving that no chemical change has taken place in the emulsion itself.

This, I think, fairly shows that the emulsion is possessed of satisfactory keeping qualities. Holding in view the additional twelve months' experience gained, and recent improvements in the details of the process, I think it holds out a fair prospect that a sensitive emulsion may be made which will retain all its good qualities as long as ordinary bromized collodion, or, indeed, indefinitely.

These remarks refer simply to the sample of emulsion I have had in my possession since January in last year, before the process was published by Mr. Bolton. Since that time improvements have been made in the details of the process, but the unchangeable nature of this preparation is, I think, established. The pellicle previous to solution will undoubtedly keep indefinitely.

GLUE AND GELATINE.

As gelatine in various photographic processes, and glue for mounting purposes, become more extensively used every year, it may interest our readers to know something more of the variable composition of these bodies as found in commerce. Mr. S. Dana Hayes gives, in the *American Chemist*, the analysis of various samples which he has examined as follows:—

Analyses of two samples of white glue of the best grade yielded the following results:—

	"No. 1 extra C." glue.	Frozen glue.
Moisture (loss of weight at 100° C.)	16.70	16.28
Gelatine, with a little animal fibre		
and fats	79.85	80.42
Carbonate of lime	1.42	1.33
Sulphate of lime	0.41	0.34
Phosphate of magnesia	0.35	0.31
Alkaline salts	0.17	0.12
Silica, oxide of iron, &c.	0.09	0.08
Oxide of zinc	1.01	1.12

Total... 100. 100.

Analyses of ten more samples of frozen and sheet glue, of common

* A communication to the Liverpool Amateur Photographic Association.

grades, and from different makers, showed the proportion of water contained in them to vary from fourteen to eighteen per cent., averaging seventeen per cent.; and the proportion of ash or mineral matter varied from three to six per cent., averaging rather less than four per cent. Two of these samples contained about one per cent. of white zinc, and two of them contained sulphate of lime.

Analyses of two samples of commercial gelatine averaged sixteen and a-half per cent. of water, and 2.56 and 3.11 per cent. of ash respectively. There was no oxide of zinc or sulphate of lime in these gelatines.

The presence of so much water was quite unexpected, and, as the quantity is nearly the same in fresh and in seasoned specimens, it is not a make-weight, although steam is very freely used in the rooms where glue is packed by the manufacturers. The carbonate of lime comes from the quicklime used for cleaning and preserving the animal matter, or "glue-stock," while the sulphate of lime is formed by the addition of small quantities of sulphuric acid during the process of manufacture, to neutralize the lime that is carried forward by the solutions of glue. The oxide of zinc is said to be added to "prevent souring," or the acidity caused by decomposition, and it also improves the colour of the glue; but it is not very generally used, as these analyses indicate. I have heard of the use of sulphate of zinc, alum, magnesia, &c., by glue-makers, but I did not find any other substance than those named above in these specimens, which represented the article commonly sold and used.

The impure glues, or those containing the most mineral matter, became almost insoluble after they had been broken into small pieces, and heated in a hot air-bath (copper oven), at 100° C., for two or three hours, until they cease to lose weight; they then soften and become dough-like, but do not dissolve when boiled in water for some time. The purer gelatines were not so much injured, and one specimen, containing only 2.56 per cent. of ash, was not materially affected by this thorough drying. The solid sheet glue, while drying in this way, tumefied, and became very porous; the frozen glue did not alter in structure.

Correspondence.

REMOVING EXCESS OF IODIDE FROM THE BATH.

SIR,—I have noticed that it has been recommended to add barium nitrate to the bath, either at the time of making it, or to rid it of excess of iodide. Allow me to state that those who are troubled with excess of iodide will find that if to the bath solution barium sulphate be added, and shaken up on filtering, all excess will have been carried down. In certain chemical manipulations with clay I have been in the habit of using this to clear a water solution.—Yours faithfully, W. DE W. ABNEY, Captain R.E.

STRONG DEVELOPMENT.

SIR,—I notice with interest your article in last week's issue on strong development; but I ask leave to point out that the principle of strong development is the same, whether the strength of the pyrogallio acid or of the ammonia be reduced, so long as one of them is strong. You will remember that I have pointed out that the proportion of ammonia and pyrogallio may be varied indefinitely, according to the class of negative required, and, no doubt, Captain Abney's work being special, he required to modify my formula for his special case.

I beg to conclude by thanking you for the way in which you speak of my introduction of this new principle in dry plate work.—Faithfully yours, H. STUART WORTLEY.

INTENSIFYING GELATINE NEGATIVES.

DEAR SIR,—In the winter of 1873-74, having some carbon transparencies to make, I found it desirable, in some instances, to intensify them, and after experimenting a little, I could intensify gelatine transparencies or negatives to any extent, and with comparative ease. I now purpose giving publicity to the means I employed, and I hasten to do so lest some more ambitious worker than myself should think of the same, and look it up from the photographic world, or, in other words, "patent it."

The transparencies in my case were made in the ordinary manner, the tissue of the Autotype Company being sensitized, printed, and developed on glass, using the Autotype varnish as a substratum. When quite dry, immerse them

J. H. R.—We described the process precisely as it was communicated to us, and we have no special personal knowledge beyond that gained by witnessing the successful working of the process precisely as it was described; we cannot with certainty, therefore, indicate the causes of your failure. We may, however, in the first place, point out that you have not, we fear, used a gelatine sized paper, and a starch or sized paper is not suitable for the process. The best results we have seen were on Turner's Calotype paper. Next, if the paper did not get saturated a couple of minutes, as it did in Dr. Diamond's hand—in warm summer weather, it may be well to add—it should, we presume, remain until it did get saturated. The further information we expressed a hope that we should shortly be able to publish must wait for better weather, as experimenting in winter is often untrustworthy as well as unpleasant. That is our friend's recorded experience in answer to our request for further details.

STUDIO.—We do not know Mr. Howarth's address.

HONESTE AUDAX.—The addition of nitrate of baryta to the silver bath inevitably produces the kind of fog of which you complain. It is simply a coating of sulphate of baryta, thrown down by the sulphate of iron developer, which at once decomposes the nitrate of baryta, and forms sulphate of baryta. But this light grey fog disappears on varnishing the negative. The grey colour of the solution after adding the baryta nitrate we have not noticed. It is probable, however, that you will find the results all right if you steadily follow out instructions, and proceed to the varnishing. If the colour had proceeded from organic matter, it would have been thrown down by the action of light—unless, indeed, it be the result of partial, but insufficient, sunning. The first action of light is generally to darken the solution, prolonged action precipitating the darkened organic matter which is the cause of the colour. Sufficient light, or a trace of permanganate of potash, will, in that case, form the best remedy.

IGNORAMUS.—Paintings in public galleries rarely can be photographed *in situ*, as there is generally too little light, and their position would render it almost impossible to copy them satisfactorily. To do the work properly, it is, as a rule, necessary to obtain permission to take them from the walls for copy, and the copying is often done in the open air, to secure a satisfactory light. The kind of lens depends much on the kind of work. A portrait lens stopped down may serve; but a triple or double combination especially suited for this work is generally employed by those who make a special branch of this work. Many of the copies of such pictures published are not photographed from the original paintings, but from copies in black-and-white painted by a skilful artist for the express purpose of photographing.

ESQUIRER.—You will scarcely find the sciopticon of much service for printing on paper, as the exposure would be very long. You may produce a collodion image with the sciopticon very well, and so produce an enlarged negative. Or, if you wish to try paper, employ the formula for preparing the paper and developing which we have published several times, and which is given in Mr. Solomon's pamphlet, employed for enlarging with the magnesium light. 2. By means of the reflectoscope an enlarged negative is produced direct from a print. The magnesium light, or some intensely actinic artificial light, is employed.

ESONITE.—It is probable that a solution of cyanide of potassium will remove the deposit. If that fail, try scraping away the coating, and when clean and dry, apply a coating of shellac varnish.

A BRISTOLIAN.—The paper should be fumed when it is sufficiently dry for printing. The ammonia requires renewing only when it is getting weak or exhausted. 2. No change whatever is required in the toning bath for fumed paper. Probably your toning bath is exhausted, and requires more gold; or possibly it is out of order from some other cause. 3. We have published many recipes for varnish, although we never recommend home-made varnish. To make a really good varnish requires considerable knowledge and skill—not a mere recipe. But if you wish to try, you will find many recipes in our back YEAR-BOOKS. Perhaps the safest and simplest varnish you can make is produced by adding a pint of methylated spirit to a pint of white hard varnish, which you can get of any oil and colourman. Fuming generally requires about ten or fifteen minutes.

A. C.—The effect of the collodion enamel is manifestly valuable as a preservative. It appears rather like a coat of varnish. Do you know the precise preparation? 2. The morocco-like texture of the negative may be due to two or three causes. One most probably is, as you suppose, the use of too weak spirits in making the collodion. Another cause may be a sample of pyroxyline made at low temperature, giving a glutinous collodion. Another cause may be the use of cadmium salts with an unsuitable collodion. The collodion is apparently thick and glutinous. Mixture with another very limpid sample is sometimes a cure. Diluting with ether sometimes answers.

NO NAME.—Mr. D. Hedges, photographer, Lytham.

A. K.—The yellow spots have the appearance of spots from imperfect fixation. Such spots are often invisible until after mounting. They may, however, arise from hyposulphite in the mounting cards.

C. A.—Both A and B are suitable for architectural work, but we should prefer B, as most rapid and giving equally good results. Both give results free from linear distortion; but you risk the effect of exaggerated perspective if you use a lens the equivalent focus of which is less than the major diameter of the picture. 2. The effect of mixing a mature collodion with a new sample is generally beneficial. It is a plan we constantly adopt. You would probably get the effect of about six months' maturity by mixing a fifteen months' sample with one recently iodized.

TRANSFER.—Rough drawing paper is, we fear, not a very suitable surface for the transfer of carbon prints by the single transfer process, the rough surface being inimical to perfect contact. It is possible that the Company may be willing to prepare a transfer paper of the kind for you. We cannot tell you precise details of their modes of preparation, for since their object is to sell the materials, they naturally refrain from publishing details of the mode of preparing them. A good preparation may, however, be made as follows:—Gelatine two ounces, glycerine half an ounce, water one pint, chrome alum two or three grains.

W. R. P. JEFFERY.—Many thanks for your suggestion. It shall have our best consideration.

D. H. A. (Belgian Subscriber).—Thanks. In our next.

COMPENSATION STOVE.—Will Mr. Howarth be so good as send his address? We have a letter to forward to him. Several Correspondents in our next.

METEOROLOGICAL REPORT FOR FEBRUARY. BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven,
36 feet above sea level.

Date.	TEMPERATURE.			ATMOSPHERIC PRESSURE.			Direction of Wind at 9 a.m.	REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1	45°	45°	43°	30.01	30.01	—	S.W.	Fair, but gloomy.
2	43°	46°	30.5	30.00	30.01	29.90	W.	Fair, but gloomy.
3	34°	41°	34°	29.83	29.80	29.80	N.	Fair and sunny.
4	30°	38°	29°	29.89	29.93	30.04	N.	Fair and sunny.
5	28°	38°	31°	30.10	30.17	30.14	N.	Fair, generally sunny.
6	36°	39°	42°	30.08	30.04	29.91	S.	Rain all day.
7	40°	41°	38°	29.90	29.89	29.88	—	Rain a.m. & p.m., with snow p.m.
8	37°	38°	37°	30.04	30.09	30.03	S.S.E.	Fair, but gloomy.
9	30°	34°	34°	29.90	29.92	29.98	—	Fair, but gloomy. Strong E. wind.
10	34°	36°	34°	30.00	30.10	29.99	E.	Fair, but gloomy.
11	35°	—	36°	29.84	—	29.38	S.S.E.	Rain from 12.30 p.m.
12	37°	43°	40°	29.58	29.61	29.70	E.S.E.	A little rain this afternoon.
13	44°	46°	45°	29.77	29.77	29.74	—	Rain a.m. and p.m.
14	44°	46°	40.5	29.64	29.73	29.69	S.	Rain this morning. Fine and sunny from 10.30 a.m.
15	38°	44°	36°	30.06	30.18	30.30	S.	Fair and sunny. Very fine.
16	40°	44.5	44°	30.32	30.35	—	N.W.	Fair and sunny.
17	40°	43°	36°	30.26	30.26	30.22	—	Fair and sunny.
18	32°	42°	35°	30.20	30.20	30.15	N.	Fair and sunny.
19	32°	38°	36°	30.15	30.14	30.10	N.E.	Fair, but gloomy.
20	34°	38°	38°	30.07	30.04	30.07	N.E.	Fair, but gloomy. Strong wind.
21	31°	37°	36°	30.15	30.18	30.15	N.E.	Fair and sunny.
22	36°	—	35°	30.12	—	30.00	N.E.	Fair, generally gloomy.
23	33°	38°	35°	29.80	29.70	29.53	N.E.	Snow at night. Gloomy all day.
24	33°	36°	35.5	29.34	29.37	29.32	S.W.	A little snow a.m. and p.m. Strong wind at night.
25	36°	38°	38°	29.37	29.40	29.42	S.E.	Fair, but gloomy. Strong wind at night.
26	42°	44°	38°	29.50	29.50	29.50	S.E.	Fair, but gloomy. Strong wind this morning.
27	38°	43°	36°	29.58	29.63	29.70	—	Fair, generally sunny.
28	34°	39°	36°	29.78	29.77	29.77	N.E.	Fair and sunny.

From the above I arrive at the following:—

	Maximum temperature observed	...	...	Mornings.	Noons.	Nights.
Minimum	ditto	...	...	45°	46°	45°
Mean	ditto	...	...	25	34	29
		...	...	36.4	40.6	37.1

Mean of whole ... 38°+ |

Number of fair days ... 20

Number of days on which more or less rain fell ... 8

Number of days fair and sunny ... 10

Number of days fair, but gloomy ... 10

During the month, as will be seen from the above, we have had much easterly wind. The rain-fall amounted to 1.46 inch, and evaporation to 1.20 inch.

Chemical Laboratory, Braystones, near Whitehaven, March 3rd, 1875.

The Photographic News, March 19, 1875.**PHOTOGRAPHY IN AND OUT OF THE STUDIO.**

COPYING BY PAPER TRANSPARENCIES—HIMES' DRY PLATES—THE VALUE OF SWAN'S DISCOVERY OF INTENSIFYING CARBON PRINTS.

Copying by Paper Transparencies.—Some time ago we mentioned the application of photography by engineers and architects, who found the process very handy for the purpose of making rapid copies of their plans and drawings, simply putting a sheet of sensitized paper under the tracings, enclosing the two between a pair of glass plates to keep them flat, and bracketing the two together by a few American clips. Professor Alexander Herschel, of Newcastle, also gave our readers a description of the method he adopted for copying his tables and observations, employing iron salts in the process, which rendered his MS. and figures in blue characters. Photography the professor found so useful for copying in this way, never making a mistake in a fraction, a figure, or decimal point, or blundering over the abstruse terms to be met with in science, that he never employed any other medium, for he could always rely upon an exact fac-simile without the trouble of having carefully to go over the copy and compare it with the original. Accountants, in like manner, we should think, would also find photography useful occasionally in this direction, as they could always rest assured that no error, however slight, has crept into any copy they have got the sun to make for them. One objection, more than any other, has, perhaps, stood in the way of employing photography in multiplying copies of facts and figures in this way, and that is the circumstance that your work is not, as a rule, produced upon paper so transparent as to allow the light to penetrate freely. When one is not satisfied with white lines on a dark ground, and desires to print from a negative instead of a positive, the difficulty becomes all the greater, for it is next to impossible to get an impression from the photographic image produced under ordinary circumstances. Waxing the original may be had recourse to, but pressing the heated wax into the paper, besides being a tedious operation, may have the effect of injuring a document you desire to preserve intact. The discovery of Herr Füscher, which has now been published some little time, may be made use of in this connection with advantage. This gentleman, as some of our readers may know, has invented a simple method of rendering paper transparent, and also of restoring its opacity again afterwards. One volume of castor oil is dissolved in two or three volumes of spirits of wine, and into this is dipped either plain paper or paper which already bears a drawing or writing of some kind. The mixture rapidly soaks into the paper, and makes it transparent; and, but a short time after the removal of the paper from the bath, the spirit evaporates, and a dry transparent film remains. In the case of plain paper, any design may now be traced or sketched upon it with Indian ink and such like pigments. Designs upon paper of this kind would copy admirably as clichés, for there is transparency enough for the rapid production by photography of a silver image upon salted or albumenized paper, and employing this, if need be, afterwards as a negative. From the latter, good and vigorous impressions can be obtained in the right sense; and although, possibly, they might not be so suitable for all purposes as copies written or sketched by hand, they would, nevertheless, be perfectly trustworthy as regards their accuracy. Professional men who would thus employ photography for copying their tables, formulæ, or designs, would do well to use either washed albumenized paper and fumed pads of cloth or paper, or the durable sensitive paper sold in commerce, which will keep good a long time; for obviously they would find it very irksome were they called upon to prepare a bit of paper every time they wished to make a copy. Their

original MS. or sketch can be changed back again to its former opaque condition by rinsing it in a bath of methylated spirit, which speedily washes out every trace of the castor oil.

Himes' Dry Plates.—In a recent number of the *American Journal of Science*, Professor Himes, of Dickinson College, gives full details for preparing his photographic plates in daylight by de-sensitizing and re-sensitizing the silver compounds contained in them. Bromo-iodized collodion is used for the films, and the effect of the light is annulled by pouring a five per cent. aqueous solution of iodide of potassium over them. If the plates, after dipping in the nitrate of silver bath, are rinsed, and then exposed for several hours to sunlight, or diffused daylight, and in this way rendered insensitive, they may be dry and will keep for an indefinite period. Just before use their sensitiveness is restored to them by immersing them in a solution of tannin (fifteen grains tannin in one ounce of water), the latter operation being of course conducted in the dark. Unfortunately, this operation alone renders all the other advantages claimed rather questionable, since, after all, the sensitizing of the plates, and drying them in the dark, in an even temperature and sheltered from the dust, is just the most difficult and tedious manipulation connected with the preparation of dry plates. The subsequent sensitizing of Professor Himes' films with the tannin solution would probably occupy but a few minutes, but the drying of them would still necessitate some hours. Moreover, the mere fact of the plates being dried twice over is a grave question not to be overlooked, for the desiccation process is a most delicate one, and a repetition of the operation would often prove the destruction of the plate, from the adhesion of dust particles in contact with the film. For these reasons, we do not think the process so simple of carrying out as others that have recently been brought forward.

The Value of Swan's Discovery of Intensifying Dry Plates.—Swan's discovery that permanganate of potash can be used for intensifying the carbon image will no doubt be largely made use of when carbon printing comes to be more vulgarized. Any one who has developed a pigment print upon glass, with a white sheet of paper underneath to watch when the action has proceeded far enough to give a good positive print, must have been surprised the first time he removed the paper and looked at the print by transmitted light. What would be a good vigorous picture upon a white basis is the mere ghost of an image looked at as a transparency, and much deeper printing, or more forcible colouring, is necessary before a good transparency can be made of it. By employing a blacker tissue, it is true enough, a good vigorous impression, such as would serve for enlarging, is at once obtained, but then it sometimes happens that this dark-tinted tissue is not at hand. But perhaps the most useful application of Swan's discovery is the following. In the case of one's negative being broken, it would suffice merely to take a good well-printed carbon positive that you may already have secured from the cliché, and cement this down with india-rubber solution, or some such material, to a glass plate. Continued immersion in lukewarm water would remove the paper backing, and leave the faint carbon positive adhering to the glass plate. This impression would then be intensified with permanganate of potash, and be capable of yielding in its turn another negative.

ART-CRITICISM.

BY W. NEILSON.*

Photography.—If this long preamble have succeeded in indicating the abuse of details in art, the application to photography is self-evident. If the artist be tempted to pander to the prevalent taste of the day, and merge the

central idea of his picture in an undue prominence of unnecessary details, the photographer is naturally still more strongly tempted in that direction, seeing he can render details with a minuteness and delicacy no artist can approach. In turning out his wonderful details, it is especially for him to remember that facility in working is not always felicity in work.

I have more than hinted that, as taste is the judgment arrived at by the endowment and balance of the artistic faculties in the individual, it generally exhibits itself in the community in modes that are far from giving one an idea of perfection; and I must add that the faculties which appreciate beauty and grandeur do not give general evidence of being greatly developed. No doubt multitudes have pleasant associations about the country in the abstract, connected with pastoral idylls, love in a cottage, and the like; but when they stand face to face with nature, they feel no responsive thrill. The blue-domed temple is no temple to them. I shall give one sample, and it is far from being exceptional.

Frequently, sailing on Loch Lomond in a steamer full of tourists, I have observed that not one in fifteen seemed to pay any attention to the magnificent scenery. They chatted, looked at their guide-books, and enjoyed the locomotion and the hill air; in short, they were "doing" the fashionable in a healthy and pleasant manner; but they were not admiring Nature. Yet these same people would look with delight on photographs of the scenes through which they were passing. The grand details of nature, blending with or relieving their magnitudes against the wide spread of shine and shade, were beyond their appreciation; but to see a tree or a rocky island put into three inches, with all the details of twigs and sparkling points brought out in a clear, startling distinctness—ah! that was worth looking at. And sometimes they would have the sense to say, "Photography is a wonderful art."

The same sort of thing may be seen in Edinburgh any summer day, when Princes Street is crowded with tourists on their way to the Highlands. Few are the glances bestowed on the unique view of Castle and Old Town: many are the heads that gravitate in the other direction towards the shop windows, which, no doubt, are well worth looking at. It is from such as these, who have little or no feeling of the beauty and grandeur of nature, that the demand for photographs full of overflowing with a glare of endless details has sprung, and they who supply the demand are engaged in a laudable undertaking, and have a fine field for their energies; but they need not think they are cultivating an art, or elevating the public taste.

Art does not consist in imitating, but in representing nature—quite a different thing. The artist knows that he cannot imitate nature without omitting her principal features—the grandeur of her magnitude—and that to give all her details diminished to a petty scale would be a mere caricature, turning the grand giant into the semblance of a paltry dwarf. He considers how he can represent in a small size some feeling of the unattainable magnitude. How is the dwarfing canvas to give a gigantic effect? He must contrive that the leading features of a landscape shall stand boldly out from the minor or unnecessary details by enhancing the one and obscuring the other. Knowing the incompetence of art to give the *all* of nature, his aim is to pronounce the leading idea of her grandeur. He throws a deep shadow on one part—not that the spectator may imagine something, but that the prominent feature may have its value enhanced by the mantling grandeur of shade from which it rises; and he throws other variety of shades here and there, to give a feeling of softness, or refinement, or tenderness, as required by the theme; and thus, whilst he pronounces the idea of the scene by so merging its unnecessary details, he carries us beyond it into the bygone of our impressions connected with the feelings of grandeur or refinement or tenderness

with which he has imbued his picture. It is only by thus representing nature that a picture obtains breadth, force, simplicity, and repose, which are essential qualities of art.

The painter has an advantage in his brush that we have not in our nobler tool, the sunbeam, inasmuch as he commands his brush, while our tool commands us. But art binds all her votaries alike: they must aim at representation, not at imitation. When the photographer has well considered his landscape, and got it properly composed—his first great difficulty—he must study it under every aspect of light, and seize the moment when the shades fall most advantageously to enhance the leading features and merge the unnecessary details. He must remember that the success of his picture depends on its shades. Let him get the gradation of shades right, and the lights will take care of themselves. The same rule applies in the studio. Brilliant details, when unnecessary, are the death of art.

Texture.—Texture is one of the essentials of fine art, and, like the other essentials, depends on an innate feeling. It cannot be acquired. It is in art what the *timbre* of the voice is in music; you may cultivate the voice, but you cannot change its *timbre*. Sir Joshua Reynolds advises artists when painting a face to think of the cheek of a peach. Texture gives the peachy softness, the life touch, the completing charm, which cannot otherwise be attained. Sir Joshua's own works show much of this charm, which is not so apparent in those of Sir Thomas Lawrence. That something equivalent in effect to this texture can be obtained in photography is evident, when you compare smooth, hard photographs with others that have a feeling of life softness—the chief charm of photography. I believe that by using successive developers of different strengths, prolonging their action without addition of silver, a peculiarity of deposit is induced, which gives the effect of texture. Texture is not an imitation of skin, but a representation of it. In Dutch heads we sometimes find an imitation of skin repulsively exact, more like an anatomical integument than a flesh consistency. The question is how to keep the lens from producing such results in heads of three inches and upwards?

Mr. G. Croughton did me the honour of noticing some remarks of mine on the subject, in an interesting paper read before the South London Photographic Society. He says, "In my experience it is entirely a matter of lighting and exposure;" and adds, "it may be obtained without any developer." Perhaps his remarks were intended to apply only to small-sized heads. I have always found the common style of developing in large-sized heads to be productive of anything but life softness, giving a mere imitation of the fibres of the skin. The larger the head the more pronounced must the texture be.

(To be continued.)

THE PRACTICAL PRINTER IN AMERICA.

XIX.

CUTTING AND MOUNTING.*

In many galleries the prints are cut as described above, and mounted upon cardboard ornamented with gilt stripes, in the oval and square forms, inside of which forms the prints are carefully mounted. Below the mounted photograph the photographer has his name printed in small gilt letters. A print cut oval, and mounted upon one of the oval mounts, has the appearance of having an oval mat over it, with the advantage of having your name printed on it. A great objection to this is that of having to choose the frame at the time of making your choice of picture, so that the check can be made out properly, thus enabling the operator to mark on the negative either square or oval, which means to cut the 4-4 prints square or oval, according to what is marked on said negative. For instance, a lady wanted a 4-4 arch-top, and on

choosing the frame at the time she decided on the style of print; she chose a square one, and the check being made out properly (having all the particulars on it), and being passed to the operator when she entered his domain, he reserved his part of it, and sat her according to orders upon it, and marked the negative as per check: One 4-4 Arch-top, No.—(of negative). Often the words, cut square, are placed on the negative; but in this case, when the style is an arch-top, it is not necessary, because the print cannot, with taste, be cut any other way.

When the print is to be mounted upon a lithographic mount, the operator marks on the negative L. M., and then the printer also marks the same letters on the back of the print before it is toned, being sure in doing so that he marks in the shadow or drapery part of the said print, and the mounter, as she pastes the print, sees the marks, and consequently mounts such prints upon the lithographic mounts. If the lady had chosen an oval frame, she would have to have a vignette style of print to look well, and the negative should then be marked (also as per check): One 4-4 Vig., No. — (of negative), cut oval. Of course prints that are printed either in medallion, square, or arch should be cut square, except in a few cases when the prints are printed plain; then they can sometimes be cut in the oval form if desired.

To those photographers who are not in the habit of this mode of working, the above may appear to be very complicated, but it is so arranged in every well-regulated gallery and where there is perfect system throughout the establishment. It is one of the most perfect ways, as regards system, connected with the orders, that there is known, and it is very seldom any mistake occurs when once the plan is in good working order. It might be supposed that this would cause trouble when duplicates are wanted from the negatives, but that is not so, for when duplicates are ordered from frame-photographs (i.e., those photographs which are to be framed), the patrons almost invariably order the same style of frame and print that was before purchased, and the printer is thus greatly benefited, because he knows how to print every duplicate that is ordered from "old negatives," and when there should happen to be a variation in the style of frame and print, the thinking photographer will readily invent some way to prevent mistakes.

When the prints are to be cut in an oval form, the excellent tool known as the Robinson Photograph Trimmer is indispensable. (See fig. 1.) It does its work so quickly and so well, that no one can estimate it too highly. It will out-wear a gross of knives, and does its work better, without tearing the prints. Guides that can be used with it are furnished at a trifling cost. This trimmer, by the way, is also an excellent thing to use in cutting medallions and masks whenever you may wish to make them. When you are about to cut square 8 by 10 prints, the plate-glass is first laid down on a level bench and the print on it, and upon the print is laid the glass that is used in cutting the print. Adjust this latter glass, and with the shoeknife cut a quick and clean cut on all sides of and close to it. If you choose, you can cut the other sized prints, such as the Imperial and Victoria, by the aid of the shoeknife and the proper glasses. I have recommended a shoeknife because it is cheap, costing only about twenty cents; then, again, it is better handled than a penknife. When cutting with the glass and knife, place two or three fingers of the left hand firmly yet lightly upon the glass, and cut with the knife in the right hand, cutting around the glass, shifting the elbows a little to one side or the other as occasion requires. (See fig. 2.) The Robinson Trimmer will also answer for cutting square



Fig. 1.

prints with a very slight round corner. There are a great many printers who use the knife altogether in the cutting of the prints, and then, again, there are many who use the shears. I generally use the shears for cartes and imperials, but for larger prints I use the knife.

It may appear to be a small matter for me to write here how you should use your glass and shears in cutting, yet there is one thing which, if observed, will save your

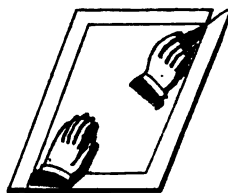


Fig. 2.

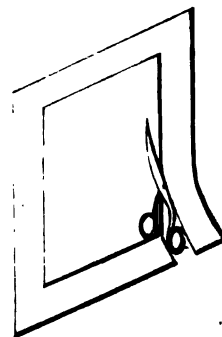


Fig. 3.

cutting glasses, and also save your shears from getting dull so quickly; it is this:—

Many persons in using the shears cut down at the lower part of the glass at an angle, so that the blades of the shears run along the edges at the bottom part of the glass-guide, and consequently the glass is very soon nicky, and in a short time some of the corners are broken off, and the glass is worthless. Now this is owing to the style of cutting (or chopping) with the shears, because every time you cut a print you also cut the glass, or try to. You should allow the blades of the shears to fall parallel to that side of the glass at which you may be cutting (see fig. 3), and you will save your glasses, and also prevent the shears from getting dull so quickly.

The rules which will perhaps help the beginner in cutting the prints are the following:—1st. Never have the nose or chin higher than the middle of the print, if the head is of an ordinary size, and the print is printed plain. 2nd. Allow a trifle more space on that side of the print toward which the head is turned, being careful not to allow too much, however, as very often the shoulders suffer by the abuse of this rule. 3rd. If the print is to be a carte-de-visite, and the head is very large, it ought to be cut higher up in the print than otherwise, so as to obtain plenty of the body to balance the head. 4th. In cutting out a print, when the figure is leaning on a table, chair, &c., always cut in enough of the accessory to give an air or look of solidity to the base of the print. 5th. Always lay your glass, when you are about to trim the prints, in the same direction as the body is, providing it is not leaning on a table, for then, of course, you must represent the idea of leaning; but when there is no such idea to be conveyed, then trim as before said, so that the body will not appear to be leaning too far forward or backward, and thus give the beholder the idea of falling. 6th. Sometimes by cutting the print so that the person will appear to be leaning slightly backward, the effect is very good, providing the figure is that of a large Berlin head. Look out that you do not overdo this, however. 7th. If the print is printed in a medallion or arch-top, you should cut it so that there will be as much of the tinted border show on one side as there is on the other, and as much at the top as there is at the bottom, and always cut prints that are printed in either of these styles in the direction that the oval or arch-top may be, and never cut them so that the cut and the oval or arch-top will lay in different directions. To do this you must be sure, in placing on the oval or arch-top for printing, that you get them to lay in the right direction. 8th. If the figure is a standing one, and the whole of it can be cut in the print, then do so, and not

cut in only part of it, as is very often done. 9th. If it is a sitting two-thirds figure, then do not think of such a thing as having the nose or chin come in the centre of the print, as per Rule 1st, but have it come considerably higher up in the print, being careful, however, that you do not get it too high. 10th. Sometimes there are groups of two, three, four, or even five persons in a carte-de-visite photograph, and, in cutting out these kind of prints, be sure that sufficient of the drapery on either side is cut in, as the neglect of that will make these outside persons appear very slender, being no balance to the figures; and, for such cases as these, either in the small card or the imperial, we have made the larger glasses to cut with as described above. 11th. If the figure is a standing one of a lady (a bride), with a long-trail dress, and leaning on a chair, then in cutting, not only cut the print so that you will give the idea of leaning on the chair, but cut a very great portion of the dress in, even if the figure of the lady herself is over to one side of the print, for the face is turned (or should be) towards that direction, and you can trim as above, without danger of hurting the look of the print, for, on the contrary, you will greatly improve it. 12th. When the background of the print is one that shows interiors or exteriors, such as the panels of doors, or a set of perpendicular rows of columns, &c., always cut the prints so that these uprights will be parallel to the sides of the trimmed print, and the cross-panels parallel to the base of it. This kind of a background is more often found in the large prints, more especially so when the "Bendann Backgrounds" are used. 13th. In standing figures, very often the place where the floor meets the background comes in sight when the print is trimmed, and in such cases you should always cut the flooring parallel to this line; and, in the great majority of cases, if the position is properly made, the figure will lean in the proper direction by the observation of this simple rule. 14th. Do not, when cutting prints, try to see how quick you can cut them, but how well, for a dozen well-trimmed prints are worth more than a hundred indifferent ones. First try and see how well, and then, after you have learned that, then see how quickly, you can cut them.

The advice and instruction which we have endeavoured humbly to give in this chapter is intended for those persons whose experience at printing has not been so extended as ours, and it is emphatically for such persons that we have written the above, and not for learned printers.

THE ART OF POPULAR ILLUSTRATION.

BY HENRY BLACKBURN.*

It was well remarked lately by Mr. Waterhouse Hawkins, in a paper on "The Graphic Method of Teaching," that through the pictorial system the mind receives impressions with the least effort, and in the quickest way, and that the graphic method was the true way of imparting knowledge. Are we, then, in the matter of giving information or in imparting knowledge through the medium of illustrations, adopting the truest and simplest methods? I venture to say that in the majority of cases we are doing nothing of the kind. We have pictures in abundance which delight the eye, which are artistically drawn and skilfully engraved, but in which, in nine cases out of ten, there is more thought given to effect as a picture than to illustrating the text. This question was discussed in the columns of the *Athenæum* about two years ago. Speaking of the system of book and newspaper illustration then and now in vogue, it was argued thus:—

"The great want at this time is a simpler and better form of illustration for novels, tales, magazines, newspapers, and for all literature of the butterfly kind. The present system is too cumbersome, too costly, and too absurd to last. It is an absurdity, for instance, committed every day, to give an elaborate drawing of furniture, made out to the exact square of the page, for the purpose of

expressing a lover's devotion, and almost as unnecessary to make a careful view of Hyde Park as the groundwork for a pun."

To standard works, and those of high artistic aim, these remarks do not, of course, apply.

The objections pointed out in the *Athenæum* to the carefully shaded view of Hyde Park, and to the imaginary drawing-room, were:—1. That for necessary reasons of speed and economy, such details can seldom be well engraved. 2. That they are generally untrue. 3. That the space occupied, and the cost incurred in production, tend to decrease the number of illustrations, and to a lack of variety.

After expressing a belief that the time will surely come when we shall look back upon the present monotonous system with considerable amusement, and upon a book or newspaper that is not illustrated as an incomplete production, Mr. Blackburn proceeded: Let us consider, shortly, the means at our command, both artistically and mechanically, and see what are some of the possibilities in illustration.

First, in the daily press. A "special correspondent" is sent, we will say, to what is called the seat of war, or is stationed in some remote country, to give the readers of a newspaper the benefit of his observations. What does he do to express himself most clearly and quickly?

In the imperfect, clumsy language which he possesses in common with every Minister of State and national school boy, he proceeds to describe what he sees in a hundred lines, when two or three skilful strokes of the pen might have expressed his meaning pictorially. I think you will admit that our ordinary-written language is clumsy, when I remind you that in order to provide the copy for a newspaper correspondent's letter such as we see written in the *Times* every morning, the point of the pen has had to travel over a distance of more than one hundred feet! This is the actual ascertained measurement, taking into account all the ups and downs, crosses and dashes of an average letter as it arrives from abroad; and yet we hear of letters "written under fire," "written on a drum-head," "in the saddle," and under the greatest difficulties when rapidity of record is everything. By systems of shorthand the time occupied in transmitting intelligence by letter is reduced, but the pictorial method of communication should come to aid the verbal, especially as simple forms will soon be transmitted by telegraph.

Think what interest would have been added to Dr. Russell's letters in the *Times*, from the Crimea, if it had been possible to have inserted here and there with the type a line or two pictorially, or even a little diagram of a movement or position. It may be said, "we had our illustrated newspapers, with every event of interest ably sketched by special artists." True, but the illustrations took time to prepare, and the reader of these vivid letters had "gone on to something else." The pictorial record should have been simultaneous with the verbal—the picture was wanted when the letter was read. Again, in time of peace there are many events of interest and scenes passing before the newspaper correspondent's eyes, which cannot be adequately described in words. In every city or town, in every place, there is some leading feature, architectural or natural, that gives character to it; and it would add greatly to the interest of letters from abroad to have them headed sometimes with sketches. On important occasions, and for special subjects, the foreign correspondent would be accompanied by an artist trained for the work; but there is much that he could do for himself. He could present to us often in outline the aspect of a street, or the curve of a line of hills on which some event of public importance was taking place; he could indicate the shape of a church spire, or a new bridge, and the plan or diagram of many objects of interest. If he could not do this actually with his own pen, he could often get it done, or transmit photographs, from which it is now possible to make a little outline in relief to print with the type in six or eight hours. The point is, that the sketch

* Condensed from a paper read before the Society of Arts.

should appear side-by-side with the written description, and really illustrate the text.

Whilst contemplating the possibilities of a more general pictorial record of events, and of a *new daily* illustrated newspaper which I hear is imminent in London, mention should be made of the *Daily Graphic* of New York, an evening paper, which has been published for two years, and which the proprietors assure us is a financial success. It consists of a sheet of four pages, about the size of our *Globe* newspaper, and is published at 5 cents (2½d). Through the courtesy of the proprietors I have just received a long and interesting account of their enterprise, from which I will read one or two extracts. But the experience of the *Daily Graphic* of New York will not help us much in our considerations to-night, because the side of the sheet bearing the illustrations (at least half of which are borrowed from European sources) is printed by the comparatively slow process of photo-lithography; and also because on the staff of that paper they once, you may remember, kept a balloon! The illustrations are printed from six steam presses, generally between the hours of 9 and 12 in the morning, and have to be drawn often at dead of night. There were six artists on the staff when I was in New York, with varying powers of skill, imagination, and endurance; one I know has survived, for he is in this room. The paper was published at two in the afternoon, and between that hour and six there were spread over the city of New York the most remarkable illustrations of events it has ever been my lot to witness. That some were artistic, and produced in a marvellous short space of time, I must admit; that the majority were sensational from a European point of view—sensational in the most aggravated sense of the word—you may judge by the copies before you. The proprietors of the *Daily Graphic* state that, although the paper was started during a period of great financial depression, they have “abundant reason to be satisfied with their success.” They attribute it principally to the founding of a large lithographic business through the publicity of the paper, a system rather new to us in England, and also, curiously enough (I am using their own words), “to an absence of all sensational news.” “Pictorial records of crime,” they write, “executions, scenes involving misery, and the more unwholesome phases of social life, are a positive detriment to a daily illustrated newspaper. In fact, the higher the tone, and the better the taste appealed to, the larger we have found our circulation to be.” I quote the sentence for the sake of the noble sentiments it contains. Taking, then, the experience of the *Daily Graphic* as an example, or as a warning, as we please, I believe that the form a daily illustrated newspaper would take in London would be a morning paper, published at twopence, with several editions during the day and evening. It would probably consist of sixteen pages, in the style of, but rather larger than, the *Pall Mall Gazette*, and one of its principal commercial features would be illustrated advertisements. The *modus operandi* of its rapid news illustrations would be, roughly, as follows:—Your sketch is handed in to the office, say between two and four in the afternoon. It is probably quite unfit for publication, but it contains an item of news of great public interest, which can be expressed on a small scale by an expert in a few lines; and so, between the hours of three and six p.m. it is re-drawn, and between six and twelve p.m. it is engraved or otherwise (most probably otherwise), brought up in relief, as in the blocks before you, ready for placing in the form with the type. Between twelve and two a.m. a paper cast is taken, by simply pressing a sheet of *papier mache* upon the surface of the form; this sheet is then bent to the shape of the cylinder (a diameter of twelve or fourteen inches), another cast is taken in metal from the paper on this curve, and—the work is done. By half-past three or four a.m. the cylinder will be revolving and be hurling off copies at the rate of 10,000 an hour.

(To be continued.)

PHOTOGRAPHIC NOTES.

BY THE ABBE LABORDÉ.*

Durable Sensitive Paper.—If you add to a silver printing bath some nitrate of alumina, the paper that is sensitized thereon will keep its whiteness, and it will never assume that yellowish tint which is generally observed upon stale albumenized paper, formed from the organic matters of the paper. You may add as much nitrate of alumina as nitrate of silver, if you like, or only half the quantity of the former. As a means of preservation, this method has no advantage over others that have been proposed, but it has several additional qualities that may be mentioned. For instance, the nitrate of alumina coagulates albumen in the same way as nitrate of silver, and for this reason has the effect of yielding an image with increased brilliancy. By reason of this more perfect coagulation, the albumen does not deposit any organic matter in the bath, and therefore the latter does not become discoloured as is the case usually. Again, the paper treated on an alumina bath does not harden so much on drying, and is not so liable to curl up at the corners, as when the ordinary bath is employed; this is a consideration of some moment, as it will lie flatter against the negative. The drawback to the process is, that the prints tone but slowly in the gold bath, so that it becomes either necessary to allow the pictures to remain in the solution for a longer period, or to employ a stronger bath.

Bromised Collodion.—The alkaline developer does not succeed well except with bromide of silver, a little iodide very much interfering with the result obtained. Bromide of silver, unfortunately, however, forms very slowly in the exciting bath. It is for this reason that one is obliged to augment the amount of soluble bromide in collodion, and in like proportion the nitrate of silver in the negative bath. In the ordinary process the iodide of silver forms much more rapidly; I think this is due to the difference in the permeability of the two products, the bromide of silver forming a very close and slightly permeable film, which retards the transformation of the underlying bromide. I have tried many ways of making it more porous, and therefore more easily penetrated, and have succeeded in the matter by adding a little glycerine to the collodion. By allowing a plate covered with a film of this kind to remain in the sensitizing bath for (say) five minutes, a film of bromide of silver is obtained of a much more uniform character, and such as will yield a capital image. Ten to twelve drops of glycerine suffice for every hundred c.c. of collodion.

To this quantity of collodion it is well also to add three or four drops of alcohol in which a little nitrate of silver has been dissolved. After the lapse of some time a slight excess of nitrate of silver is precipitated in the state of bromide, and the collodion presents an opaline tint, and a transparency which it keeps indefinitely.

Collodio-bromide.—The collodio-bromide process has not yet realised all the hopes which its disciples entertained. Very simple at first sight, the process became quite embarrassing by reason of the care to be exercised to keep the collodion from the light, and also because the liquid had a tendency to become poorer in bromide of silver, which it deposited, and thus the conditions of success were continually altered. I have found that by adding a little acetic acid to the collodion, the precipitation of the bromide of silver is retarded, and sometimes even completely arrested. Acetic acid is one of those products of the decomposition of ether exposed from time to time to the atmosphere; and if you often find differences in the properties of such and such a collodion to hold bromide of silver in suspension, this is due probably to the more or less decomposed character of the ether contained in it. Acetic acid employed in this way will be a resource for such amateurs—rather few, I fear—who desire to make use of collodio-bromide. If photography upon glass had made its debut with this process, there is no doubt the process would have been improved by separating the two products, and employing them as is done at the present moment. (To be continued.)

* Bulletin de la Société Française.

The Photographic News.

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THE LATE PROPOSED ALTERATION IN A LAW AT THE PHOTOGRAPHIC SOCIETY.

A CURIOUS illustration of the danger of a litigious spirit taking possession of individuals or communities was furnished at the late meeting of the Photographic Society, when a proposed minor alteration in a law was met, not with a consideration of its expediency, but with an attempt to render it impossible by a strained application of an existing law. And the most remarkable feature in the case was, that whilst nothing need have been more simple than the case as it stood, nothing more obvious than the actual power of the meeting to make the alteration, if, on consideration, it were found expedient to do so, all this was lost sight of in the spirit of litigiousness which suddenly sprang up and enveloped the real question in the smoke of the skirmish.

The facts are simple. In the laws of the Society a clause exists, which has existed from the beginning, to the effect that no member shall have the "privilege of voting on any occasion unless he shall have paid his subscription for the current year." This clause has, however, been practically a dead letter, inasmuch as no question as to payment was ever raised previous to voting. When, however, twelve months ago, a requisition was sent to the Council calling a special meeting to make changes of a revolutionary character, and when it was found that amongst the names appended to the requisition was one, at least, assuming membership without ever having paid one penny to the Society, either of subscription or entrance fee, it was found desirable to put the clause in question in force, and make payment of all dues to the Society a condition of voting. Until the annual meeting just past this was the only occasion on which the clause was ever enforced. The late annual election involved new machinery: the Secretary found this law in existence, and having no instructions, took the most obvious course which presented itself to carry out the law, sending to each member in arrears a circular with an extract from the enactment in question, and intimating that a balloting paper would be forwarded on receipt of the amount of subscription due. The receipt of this circular gave offence to many, and the operation of the law, it is probable, materially limited the number of votes returned. Mr. Hooper was anxious to secure a modification in this clause in order to avoid trouble in future, and having neglected to give the due notice in time for a motion at the annual meeting, the Chairman at that meeting announced that the next meeting (that held on the 9th inst.) would be made special for considering Mr. Hooper's motion, of which he then gave due notice; and the notice was duly printed in the Society's Journal. The meeting having been made special, at the close of the last ordinary proceedings, Mr. Hooper

proposed his motion, which was simply to the effect that no member should be permitted to vote unless he paid his subscription for the *past* year, instead of the *current* year as the law now stands, the object being to avoid the inconvenience of disqualifying a member for non-payment of his subscription within a few weeks of its having become due.

The wisdom of adopting such a motion is, of course, open to question, and much might be fairly said on both sides. We are strongly inclined to endorse the views expressed by Mr. Bird, that in the affairs of a Society, as of a nation, taxation and representation should go hand in hand, payment for the coming year preceding voting for the officers of that year; although, at the same time, if there were no other method of meeting the difficulty, we believe that many would probably acquiesce in the motion as a matter of expediency. But in the debate which followed, the rectitude or expediency of the motion was almost ignored. The motion was no sooner proposed than Col. Wortley objected that the meeting had no power to deal with the question, because, according to Law XI., no alteration could be made in any law except at an annual meeting or special meeting, and a special meeting could only be called by the Council. He further objected that a notice to every member was requisite of the intended motion. But in truth the meeting was a special meeting, duly appointed by the President, who for such purposes is always the representative of the Council; and the notice had been most fully and duly given in the organ of the Society, its own Journal, sent to every member. Col. Wortley contended that notice should be by letter; but this is an interpretation of his own which finds not one word of warrant in the laws. Another point as to the legality of meeting for such business was curiously overlooked: a special general meeting or annual general meeting can be adjourned *de die in diem* at the chairman's pleasure; and the chairman on this occasion practically did no more than adjourn the business meeting, then in progress, for a month, to permit of the due notice of the proposed motion being given. Thus it will be seen the vision of cumbrous machinery called up was doubly baseless, and unsupported by any groundwork of fact. The President declined, however, to decide as to the precise provisions of laws which had been made during the period of his absence from office, and which, with a touch of human nature (pardonable, if slightly amusing), he seemed not unwilling to believe were as obstructive as Col. Wortley described them to be. Mr. Stillman, ever ready as a Freelance to join in any fray, at once endorsed Col. Wortley's objection to the legality of the meeting and the President's comment on the laws, which he stigmatized as obscure and impractical, innocently overlooking the fact that the law in question was, with the exception of the final ratification clause, copied verbatim from the cumbrous and prolix code of twenty-five laws and seventy-six clauses recommended by the committee of which he himself was a member! The law, it is true, might be simpler in construction, but there cannot be a doubt as to the meaning of its provisions in the mind of any reasonable man.

Turning for a moment, however, from the question of construing laws, let us glance at the usual practice. Where an actual doubt exists, it is customary and wise to seek its solution in precedent. The custom of the Photographic Society—which has always had similar enactments, but still more stringently expressed in relation to the alteration of laws—when any similar modification in the existing code has been found desirable, has been for the chairman to announce at one meeting that the next meeting would be made special for such-and-such a purpose, due notice in the Journal has followed, and the desired alteration has been effected at the termination of the next monthly meeting made special for the purpose. The Society has, in short, carried out precisely in all respects similar arrangements to those made at the last meetings for

Mr. Hooper's motion. This has been the general precedent. But let us cite a special instance which possesses a singular pertinence to the present question. The difficulty which Mr. Hooper's motion attempts to meet arises chiefly out of the fact that the Society's financial year commences in January, whilst its annual meeting does not take place until February, thus making the subscription become due a month before the annual meeting. At one time the financial year commenced and ended at the time of the annual meeting; but for certain reasons it was deemed expedient a few years ago to change the commencement of the financial year. Now, this very change in the laws was made at just such a meeting as that held on Tuesday week, announced in precisely the same manner, and with precisely the same kind of notice to the members.

But there was one other objection raised by Col. Wortley. The chief difference between the present enactment in relation to the alteration of laws and that in the old code is a provision against revolution in the Society without time for deliberation, and a final clause enacts that the ratification of any change in the laws agreed to at a general meeting shall be by ballot of the entire Society. Col. Wortley objected to invoking such cumbrous machinery for such a trivial matter. And the objection seems natural and sound enough; only it was singularly inopportune. Col. Wortley and every one else joining in the discussion seemed to forget that the code of laws itself has not yet undergone that ordeal. The laws passed during last session have not yet been ratified by a ballot of the whole Society. The delay in carrying out such a project was intended to meet just such contingencies as the present. When the new code was somewhat hastily prepared, it was foreseen that minor points might easily be overlooked, and when the laws were presented to a special meeting called for the express purpose of receiving them at the end of the session, it was distinctly announced from the chair that they would very possibly be found capable of revision, which could be considered at the next annual meeting. It would manifestly have been unwise to press for their final ratification, by the ballot of the entire members, until after opportunity of revision had been made available to every member who might consider it desirable.

As Mr. Hooper's motion was passed subject to further consideration of the legality of the proceedings, it is probable that it really will acquire the force of law. But it is, we apprehend, scarcely necessary. All the offence complained of might be avoided, without altering the law, by following the precedent of other learned societies. It would be simply necessary—instead of sending a note to members in arrears, informing them that a balloting paper would be forwarded on payment of such arrears—to send to every member a balloting paper, with a circular of instructions stating the law on the subject. All balloting papers duly sealed could be forwarded, together with the amount of subscription, to the treasurer, who would hand the sealed document to the scrutineers. We need not enter into further detail as to the machinery here; it is sufficient to indicate that a mode exists whereby payment of current subscription, as a condition of voting, can be carried out without inconvenience or offence.

SPONTANEOUS DECOMPOSITION OF PYROXYLINE.

In a recent letter to our Philadelphia contemporary, Dr. Vogel raises the question whether photographic pyroxyline is liable to spontaneous combustion or not. He says:—

"A high judicial court has recently raised here the question if photographic cotton is subject to spontaneous combustion or not. A merchant forwarded a package of gun-cotton (wrapped in paper) by mail, and the package exploded on the way, causing considerable damage. The

merchant had to appear before the court, as by our laws it is forbidden to forward articles by mail which are subject to spontaneous combustion. An expert, who is not a photographer, but an apothecary, states that gun-cotton very readily explodes by spontaneous combustion; and this dictum causes, of course, much surprise. Probably the apothecary mistakes the cotton used for collodion for the cotton used for blasting and gunnery. Both these substances are very similar, but also very different. The one explodes with great violence, the other but moderately; the one dissolves in alcohol and ether, the other not; the one used for photographic purposes contains a lesser amount of nitrogen than the other. These differences are unknown to many chemists, or they do not take them into consideration. Unfortunately, most of our learned chemists do not trouble themselves much about photography; so I read recently, in a very good new hand-book of chemistry, that iodide of silver is reduced by sulphate of iron, which is absolute nonsense.

"In regard to collodion cotton, I have observed circumstances under which the cotton would not have escaped combustion if it was at all subject to it. I have received specimens from England, France, and America; they are accessible to my scholars, who are not very particular in their treatment. Some samples are wrapped in paper, others in bottles. One sample, packed in a tin box, was exposed for months to a hot summer sun. In short, the cotton has been exposed in every way, and I never heard of spontaneous combustion. I do not hesitate, therefore, to declare collodion cotton not subject to spontaneous combustion, and the explosion in question was probably due to carelessness of the post-office officials, who likely smoked."

The question raised is one not free from difficulty. Photographic pyroxyline, whilst undoubtedly a very different body in many respects from gun-cotton proper, is so nearly allied to it that in the manufacture of either there is apt to be produced a trace of the other. The enquiry into the Stowmarket explosion some time ago showed that much uncertainty still prevails as to the possibility of spontaneous explosion in gun-cotton, the general tendency of the evidence being to prove that imperfectly washed gun-cotton is readily liable to such a result. In like manner we have known pyroxyline of a perfectly soluble character decompose spontaneously; not, indeed, so as to cause combustion or explosion, but sufficiently to cause the evolution of red nitrous fumes, and leave simply a little semi-liquid gummy residue. The danger of such a result with carefully prepared and well washed pyroxyline is very slight; but it exists, and is sufficient to suggest the necessity of care in storage. The danger is greater if it be kept closely packed and protected from the atmosphere. If kept loosely packed in tin boxes or glass jars, with loose covers, the danger is reduced to a minimum. The possibility of coming into contact with sparks of fire or a lighted cigar, common sense will dictate should be avoided.

ON PHOTOGRAPHIC STATUS.

BY EDWIN COOKING.*

My name having been mentioned in a paper read by Mr. Hooper at the January meeting of the London Photographic Society, implying that I was the first, or nearly so, who brought before the notice of photographers the subject of some distinctive mark being conferred upon them, probably a few remarks from me embodying my views at that time may not be out of place at the present moment.

In 1867, when I read before this Society my paper, "A Suggestion for Raising the Status of Photography," I had arrived at the fact of the inability on the part of the public to properly distinguish between those who practised photography mechanically, and those who brought cultivated

* Read before the South London Photographic Society.

taste and artistic feeling to bear upon it; hence I thought that some extraneous expression of opinion other than that of the photographer himself, or the public, would meet the difficulty. The idea I endeavoured to illustrate was this, that some properly-elected body should possess the power of determining the fitness of those who submitted themselves to such a tribunal, and also to grant some sort of certificate to such fitness. The immediate result of this, I thought, would be that those who did not consider it necessary to avail themselves of this examination must be content to be considered non-efficient, or, at all events, outside the ranks of qualified operators.

I advocated two degrees of merit—the one being, as I have just mentioned, universal in its application, attainable by all who evinced capabilities for photographic work, both in the matter of artistic taste, and in chemical and optical knowledge; the amount of proficiency necessary to gain such certificate to be set forth from time to time by the duly-elected examining body. These photographers would be in position something like the medical profession, who obtain the title given by the College of Surgeons, or the ordinary chemist or druggist, who obtain certificates from the Apothecaries' Company or Pharmaceutical Society, without which any one who appeals to the public for patronage would be a quack; in short, not a fit and proper person to undertake what he professed to do.

I then further advocated the possibility of a much higher grade of examination by a mixed tribunal of artists as well as photographers, to possess the power to grant some honourable title to such as had produced great results, the number of such to be limited; and this, consequently, would inspire emulation throughout all ranks of our profession.

I never for one moment entertained the idea that the simple payment of a subscription to any society should entitle the person doing so to any distinctive mark. My object was the gradual raising of professional status, by having some defined standard of excellence in all branches established, so that every photographer could see how near to, or far from, the desired position of honour he might consider himself. How far the last seven years of the history of photography would have justified such an order of things, and whether the time is ripe for such an institution, may possibly now be made the subject of thought and discussion.

It will, I think, be granted by all who give any thought to the subject that, without interfering in any way with the liberty of any one person who thought fit to venture upon getting a living by entering our profession—at the same time photography having ceased to be a wonder and a marvel—its true friends must see the necessity of laying down some laws or rules for the future working of the same, and the introduction into its ranks of more properly-educated, and, consequently, more qualified, exponents than has hitherto been the case.

But the germ of what I have been suggesting, I think, already exists, inasmuch as the Photographers' Benevolent Association, just established, must in its working enforce some sort of qualification before it could with justice dispense any of its funds; so that we have only to build up a ladder, as it were, of gradual ascent to arrive at the pinnacle of what, I think, if once established, would prove to be as valuable an aid to the progress of photography as anything that has hitherto been done towards that object.

It must be admitted that, supposing such a tribunal had existed seven years ago, the necessary scale of qualifications must have been raised much higher at the present day, when we see the marvellous strides that photography has made in its pictorial element—by which I mean the active cultivation of latent artistic feeling, the daring attempts to regulate light and shade, and the greater attention given to the disposition of lines, involving the study of composition, showing that there has arisen a wonderful development of power evincing design and thought.

All these results, I cannot but think, point to the fact

that we have approached the time when such a matter as that I hinted at seven years ago may now be duly weighed and pondered over.

So far we have considered the advantages of some distinctive title in favour of the public or those who benefit by the advanced photographer; but something else remains which should receive the earnest attention of all who have felt the difficulties arising from the uncertain status, or want of actual defined social status, that of late has forced itself upon those who do not like to realise the possibility of being looked upon as one-half shopkeeper, simply selling a manufactured article, whilst the other half exercises and cultivates some higher mental thought and power than is usually considered necessary for those who merely buy and sell.

I take it, then, at the moment, the impetus which this subject ought to receive must spring from the desire to raise and elevate the author and composer of a pictorial production far above the mere disposal or supplying of the same, which really only should be supposed to exist as a secondary matter.

If, then, the cultivation of latent artistic tendencies and consequent higher phases of productions have brought about a desire to have some distinctive marks conferred, whereby the results of cultivated mental and elevating powers and taste for what is good, true, and beautiful should not only be distinguished from what is simply mechanical, but should meet with a reward both personal and social (which many would so deservedly be entitled to), nothing should stop the hearty co-operation of all those who by the power of their names can put the machinery into motion for such a consummation.

I do not take upon myself to make any practical suggestion relative to how all this might be done. I simply once more sound the key-note, so that all those who sympathise will respond and take up their parts.

HINTS AND SUGGESTIONS.

BY D. H. CROSS.*

I HAVE tried varying the strength of silver solutions for negatives, and have been surprised to see the extent of variation that can be successfully employed, and that, too, without essential change of the collodion, developer, or manipulation. Forty grains of nitrate of silver is the maximum, and fifteen grains the minimum, to the ounce of water used. Both proportions were tried several weeks in succession, on all kinds of work, without injurious change, except that common to all baths from accumulation of alcohol and ether. For a standard strength in the studio I should not exceed thirty grains to the ounce of water. First: Because less injury results to the plate if it remain in the solution a few minutes after it is sensitized. Second: A longer time may elapse after the plate is placed in the plate-holder before it is developed without the appearance of the annoying matt stains, which are so common in the hot season, when forty or forty-five grains are employed. These experiments have proved to me that much greater latitude may be exercised with our bath formulæ than is generally supposed, with equally as good results.

Iodizing the bath I consider not only unnecessary, but actually injurious, when the strength of the solution does not exceed forty grains to the ounce. Having tested this matter often within the past ten years, I have abandoned the practice entirely. If let alone the bath will take care of itself, in this respect, from first to last, while nothing desirable is sacrificed; pinholes are thus banished effectually by removing the cause, viz., excess of iodide of silver.

When ammonia salts predominate in the collodion it is better to reduce the proportion of iodide from five to three and a-half grains; of bromide, from two to one and a-half grains, to the ounce of plain collodion, if the bath is thirty grains or less to the ounce.

* Read before the N.P.A., America.

The practice now becoming general, of dipping the plate in the bath, film side down, I strongly recommend; by so doing, uniformly clean work may be made, without the trouble of frequent filtration. I filter only after evaporation, and avoid frequent evaporation, by leaving the cover of the bath open, so that the fumes of alcohol and ether may escape spontaneously.

A cover for the bath should be made so that it will allow these fumes to escape, and exclude the light and dust. Here is a chance for a little inventive genius. Having had occasion the past few years to try several processes for producing "large work," I have concluded that it is much better and easier made direct when the best appliances are at hand, and the required size does not exceed 20 by 24.

For small children, or very restless subjects, box-light copies, &c., enlarging processes are indispensable, of course; still it will pay many establishments to provide themselves with the improved instruments for large direct work. Life-size busts may be made with an exposure of one and a quarter to one and three-quarter minutes very satisfactorily as plain photographs. Children, three-quarter length, on 18 by 22 plate, with ten to twenty seconds' exposure, when circumstances are favourable. During exposure of the plate, I have often succeeded best by facing and engaging the sitter by conversation, or other means that judgment and experience suggest at the time. Instances are not uncommon where the best results are obtained by keeping the sitter unconscious of being in the "dentist's chair"—by not informing "when the tooth is to be drawn."

Let us not degrade ourselves or our profession by trying to talk off faulty work, or by reducing prices, but bear in mind that good work will find patronage in proportion to its merit. Many people to-day can readily discriminate between the good and the bad, and he who adopts this principle will surely gain by it in the end. Let us not content ourselves to practise our art mechanically as artisans, but think, study, and earnestly strive to be artists in a proper sense; and see to it that we elevate our profession to a higher standard, if not, indeed, to fine art itself. I have an abiding faith in the capabilities of photography, that it is destined to be the art (if it is not already) in the realm of portraiture, at least. "Last, but not least," let us avail ourselves of the light the old masters have thrown upon the subject of art culture. Many very valuable works may now be obtained upon this hitherto neglected subject.

HOW TO LIGHT THE SITTER.

BY H. W. BOOZER.*

AMONG the changes in photography during the past few years, none have been more noticeable than the methods of lighting our models. For a time "posing" the sitter was the all-engrossing photographic topic; but the disposition of light and shade, and the best means to effect the desired object, is now the operator's great work.

The skylight of our venerated fathers of the art was but too literally what its name implies, and is justly censurable for much fault-finding from the unlucky wight who "vegetates" beneath. The skylight is chargeable with much of the ill-health peculiar to photographers as a class. It gives him an atmosphere of great extremes; a furnace of heat in summer, a frigid zone in winter. In low rooms, and especially in tents and cars, the breathing is done in a strata of the most impure air, most of the time overheated, and in winter the feet are most of the time on an ice-cold floor, enough of itself to induce permanent ill-health. As a general thing, the skylight is so high and difficult of access, it is almost an impossibility to keep it clean; the occupant beneath abiding in the delusive belief of a large area of transparency, under-times, consequent on the large

surfaces of dirt and stains generally invisibly spread out between the sitter and the actinic power he so nervously woos. In wet weather the "light" leaks more or less. This is more than aggravation; but "what can't be cured must be endured," and after soaking cameras, back-ground, carpets, &c., a few times, they are, with exception of carpet, carefully placed out of danger before the storm, and kettles, pails, &c., take their place. Very few skylights there are but what are affected with this malady to a greater or less degree.

Sunlight driving down on your lens and into the room, making false lights which bewilder and confuse, deranging the perceptions during the limited available time spent in the sitting, rendering the impression, on examination, a defective one. It is seldom the sun does not reach it more or less of the time, and the changes are so rapid that timing is much of the day difficult, to say nothing of the intricacies involved in the production of effects of light and shade, where the fundamentals with which to do are never twice alike.

Did you ever work a sidelight? If not, you would be astonished on trial at its availability for photographic use, and at the effects that can be obtained by the use of "cut-offs" and reflectors. A marked skylight effect can be obtained by a white reflector stretched from the top of the light angling to a point of convenient height on the farther side of the sitter. An intercepting "cut-off" prevents overlighting on the one side, and a reflector on the other mellows the shadows into half tone. With care the eye can generally be rendered pure and beautiful without false lights, or at least the latter so subdued as to be very slight, and always made good by lightly retouching the print. Words, however, will fail to convince the photographer under the influence of that potent word "skylight," bequeathed us by the fathers in the art, whose ideas of light were entirely satisfied by a hole in the roof facing north. But when it is remembered that one of the world's best operators has attained a wide spread reputation in Montreal by the use of high sidelight only, the latter is certainly worth a careful trial by the photographic truth-seeker.

The great masters in the world of fine art, the men of the past who through their works will always live, have given us as the proper lighting of the portrait a small volume of light falling from some distance on the model, at an angle from above of forty-five degrees. It should be the work of photography to produce just this effect in detail, by the best means attainable. It is evident, were the same means used, that the result would be vastly different in photography from that in nature. In the one instance the light is gently modulated, giving fine and clear half tone, and great detail even in the deepest shadow; while in the other there is over-lighting on one side of the face, which abruptly turns into the deepest shade, obliterating the half tone in both light and shadow, and making it the farthest thing possible from that which was seen, and an entire failure in an artistic point of view.

It is learned by photographic experiment that the diffusion of light over the face increases in proportion as the model nears the glass surface, and decreases with distance; also that the actinic power of light increases in the same geometric proportion in the same way, and *vice versa*. Putting these facts together, it is evident that the best effects are attained by bringing the model near the glass, and the fact is proven by so doing. Experience in demonstrating this has brought low skylights in fashion, and many galleries now lessen distance by false raised floors, which thus bring the sitter nearer the glass surface, and so very much improve the quality of the work as well as shorten the time for sittings.

It is evident that a light built at an angle of forty-five degrees would not be such photographically unless it were placed at an extreme elevation, from the fact that the light from the sky is more powerful than that from among the

* *Western Photographic News.*

dark objects on the earth's surface. And it will be found that the inclination of the glass should be two-thirds in a vertical and one-third only in a horizontal direction, on the second floor of a building. It should be about nine by ten feet only in size, the longest up and down. Can be made in two sashes, and thus be self-supporting. The room should be nine feet in height at the upper portion of the light. The sash should reach within twenty inches of the floor.

By the general use of a tissue paper interceptor on the light, and a small reflector the further side of the subject, any effect conceivable may be obtained. While detail is exquisitely fine throughout, the picture will also be vigorous and brilliant, the prominences and high lights being brought out finely by the seeming play of a flash of light over the face from the right angle above and forward.

As regards direction, a north light obviates the use of curtains, which must be used more or less at times from any other point of the compass; the objection to it being that it is weak at a time of day when much of the custom comes in late in the afternoon. In this respect a west light is wondrously available; and when it is taken into consideration that so much cloudy weather is encountered, one is almost tempted, after trial, to curtain during sunlight, and use a west or south light. An east light is essentially a north light for much the largest proportion of work that is done. All who have experimented know that the actinic quality of the solar ray is the same from any and all directions, and that it is its right use only that will produce good results.

After twenty-three years' experience with almost all kinds of both sidelights and skylights, it is the opinion of the writer that the above-described light will be in the future the model one of the art photographic; and among the reasons for this belief not the least is the fact that the history of photography, especially during the last few years, shows that its practice is working in this direction as fast as a change of such a nature, involving as it does such great difficulties, will allow.

HINTS IN ENLARGING.

BY A BELGIAN SUBSCRIBER.

I KNOW that it is the custom to impart to brother photographers any little information one may possess, or any what you term in England a "dodge" which may have been successful. My plan of enlarging photographs may possibly be worth noting, and for this reason I have jotted down a few particulars.

The picture to be enlarged, whatever it may be—whether a carte-de-visite or other format—previously to being set up in its place, is marked on the margin with a few black dots, which I find aid one materially in the operation of focussing.

The collodion I employ is any kind that will work well for wet plates, and, as soon as my film has been sensitized in the silver bath, I wash, to remove all the excess of silver about it, and then cover it with a mixture of—

Glycerine	...	...	...	1 part
Water	...	...	...	1 "
Albumen	...	...	...	1 "

The exposure I give varies from one to two hours, according to the size of the picture. I operate in a good light, and, if possible, I reflect upon the object the sun's rays by means of a mirror.

The development is proceeded with as if one had to do with a dry plate, the exposed film being put into a horizontal dish containing an alkaline developer, the formula of which has frequently been published.

I intensify generally with a four per cent. solution of bichloride of mercury in water, and ammonia, the image being well washed after the application of the bichloride. I fix in the ordinary way.

Correspondence.

CITRIC ACID.

DEAR SIR,—Will you allow me a space in your News for a few remarks as regards citric acid. Citric acid, as we know, is imported from the West Indies, and, as it comes so far, is liable to undergo decomposition on the way. On this account it is very advisable for the photographer to prepare his own. It is very simple, and easily managed. Take ten ounces of expressed lemon juice and boil for a few minutes, then add to it, when cool, the whites of three eggs, and stir the mixture so that the albumen is mixed with the juice. Boil again, stirring all the while, and allow the coagulum to settle. When cool, filter the sour liquid, and boil again, adding to it, gradually, powdered chalk as long as effervescence is produced. Citrate of lime is now formed, which is but sparingly soluble in water. The dark coloured mucilaginous liquor is filtered off; the residue is well washed, and afterwards decomposed by a quantity of sulphuric acid, the same weight as the chalk which has been added. The sulphuric acid is diluted with seven times its weight of water until the citrate of lime is completely decomposed. By filtration the citric acid is separated from the insoluble sulphate of lime, and is afterwards evaporated until a pellicle forms; it is then set aside to crystallize. The dark coloured crystals are removed from the supernatant liquid by a strainer, and again dissolved in pure water. The liquid is again evaporated as before until the formation of a pellicle takes place, and set aside to crystallize. By repeating this operation two or three times the crystals become quite pure.

Asking pardon for trespassing on your valuable space,—I remain, dear sir, yours truly,
C. R. P. VERNON.
Grafton, Underwood, Kettering.

NITRO-GLUCOSE.

DEAR SIR,—In the years 1865-6 I was conducting a course of experiments with nitro-glucose, having been led to do so from an article in your paper, as to its uses in the process of printing out enlargements by the aid of the solar camera, by Dr. Van Monckhoven. Finding it difficult to procure, I set to work to make it myself, and, like friend Noton, after repeated failures, succeeded. Dr. Van Monckhoven's instructions were insufficient, as I believe I proved at the time. After making a few ounces, and finding it very difficult to eliminate the acids, I applied to Messrs. Hopkin and Williams for a sample, which they kindly supplied, and having occasion to go to Newcastle I saw the late Mr. John Mawson and his partner, Mr. Joseph Swan, to whom I detailed my experiences, and obtained from them a sample that they had kept in a bottle for some years. On my return I tried all three samples, and had the gratification of finding my own manufacture the best of the three. Unforeseen circumstances stopped my experiments, and from that time to the present I have not resumed them, but feel inclined to do so this year.

My object in addressing these few lines is, that they may reach the eyes of Mr. W. B. Bolton, who wrote two able articles on this product in August, 1874, and also Mr. Noton, who has detailed his experiences before the Manchester Photographic Society last month, and that both these gentlemen will favour me with a sample, with full particulars as to its age and character. At some future time I shall have much pleasure in detailing my experiences with this substance.—I remain, dear sir, yours truly,

68, Canonbury Park South, N.

GEORGE HOOPER.

THE BOUDOIR AND IMPERIAL PHOTOGRAPHS.—DISEASES OF PHOTOGRAPHERS.

SIR,—The introduction of any novelty in order to stimulate photography will be welcomed by all engaged in it professionally. The "Boudoir" portrait, now, I may pre-

sume, fairly launched, will no doubt take, and the "Imperial" of Mr. Lewis; but I would call your attention to the "Imperial" of Mr. Robinson, referred to in the News of September 25th, 1874. Would it not be advisable to communicate with those gentlemen, and consider the size under such a title, and so secure uniformity, as also whether this size had not better be circulated *under glass, or framed*? No one is better able to undertake this matter than yourself, and I hope you will see your way clear to do this, that frames and mounts may be made for this size also.

I was much interested with your remarks upon the health of photographers, as also with the letter of "A Physician." The fresh air will do much when it is possible for photographers to take exercise, and in addition to this, let me again recommend the Turkish bath, which I know from experience will draw from the system the chemical that so insidiously permeates it.—I am, dear sir, yours very truly,

PROGRESS.

[The size which Robinson and Cherrill designate as Imperials is, so far as we remember, 10 by 8, and is issued under glass ready for framing. The new style introduced by Mr. Lewis under that name is expressly intended to avoid the necessity for glass, and is really intended for placing in an album, as are all the styles issued with narrow margined mount like the card. When a style becomes universal, or even popular under a special name, it is probable that the name will cease to be used to designate something else.—Ed.]

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held in the Hall of the Society of Arts, on the 11th inst., the Rev. F. F. STATHAM, M.A., presiding.

The minutes of the previous meeting having been read, Mr. Vernon Heath was elected a member.

The HONORARY SECRETARY (Mr. Cocking) then read a paper "On Photographic Status" (see page 139), which was followed by a desultory conversation, in which the President, Mr. Aldridge, and others took part.

A vote of thanks having been awarded Mr. Cocking, the proceedings terminated.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held on Monday evening, the 1st instant, Mr. J. W. GOUGH, President, in the chair.

The minutes of the last meeting having been read and confirmed, THE SECRETARY laid on the table the February number of the *Philadelphia Photographer*, the photograph which accompanied it being inspected by the members with interest.

The conversation turning upon Mr. Howarth's stove,

MR. ILLINGWORTH stated that since the reading of Mr. Howarth's paper he had had one of the stoves placed in his establishment, with the performance of which he was highly satisfied, the stove heating his gallery, reception room, and work room, keeping the former at a temperature of 50 deg., and the two latter at 60 deg.

MR. GUNSON confirmed the remarks of the last speaker by stating that in his gallery, one cold, frosty morning, when he arrived he had found the temperature at 28 deg., and in one hour from the stove being lighted the thermometer at a distance of five yards from the stove registered 50 deg., and in the course of the day reached 60 deg.

MR. GREAVES (Halifax) then exhibited to the members the method of developing and transferring carbon prints, developing a number possessing great delicacy and beauty, some of them being fine examples of lighting and posing.

MR. SMITH (Halifax) was of opinion that the carbon process was not as yet likely to supersede silver printing, as he thought, owing to the difficulty in printing, it would require much more care than a silver print, which could be inspected during progress.

MR. GREAVES replied that, so far as the difficulty in printing went, a man of good judgment in silver work could print equally well in carbon. All good printers classified their negatives, and

nothing more was necessary in Autotype printing. Having ascertained by the actinometer the requisite number of tints necessary to fully print any negative, by marking that number on the negative there could be no further difficulty, as that was a guide for every other print from that negative, one tint being a standard of intensity.

In reply to a question by Mr. Braithwaite (Leeds),

MR. GREAVES said that, in his opinion, an Autotype print would bear rougher usage than an ordinary print upon albumenized paper; and that, although a certain matt surface was inseparable from the single transfer process, with the method of double transfer it was entirely optional with the operator whether he produced a matt or glazed surface. He might produce a print with a perfect enamel surface equal to the polished surface of the finest plate glass.

In reply to a further question by the same gentleman respecting the cost for small pictures,

MR. GREAVES further said that a photographer executing his cartes in Autotype must raise his prices—he should think about twenty-five per cent. If he personally could devote his time to printing and developing the prints, he should certainly prefer it to silver printing, as it was much more desirable to execute the prints in permanent colour; but under the present arrangement of business, in which that department had to be left to an assistant, it would probably not be so satisfactory, as the development required more judgment and care than the usual method of toning and fixing. Therefore, comparing results, a silver print unquestionably had the advantage, in being more easy of production.

THE SECRETARY inquired if in practice it was found necessary to make allowance for the continued action of the light after the tissue had been removed from the negative, supposing the prints were to be developed shortly afterwards.

MR. GREAVES said that in his practice he had found it advisable to allow a margin if the prints were to be kept for a few hours. If he purposed keeping them till next day, he should print to about two-thirds the actual depth required.

MR. W. E. BATHO remarked that it was a disputed question whether the continuation was really due to the action of light, or was a catalytic reaction set up in the sensitive gelatine film. If a piece of tissue were sensitized and carefully excluded from the action of light, and put away for a short time, it would be found to have become insoluble, and if it were developed a tint would be found over the whole surface.

THE SECRETARY was of opinion that the question might be solved by printing on tissue from a negative sufficiently dense to preserve the whites, placing away for a while, and then developing. If the action were continued only where the lights had acted the whites would remain pure, but if the action were all over the film the whites would be proportionately sullied.

On the proposition of the Chairman, seconded by Mr. Rawnsley, the thanks of the Society were unanimously accorded to Mr. Greaves for his interesting practical lecture.

A paper on the Woodbury Process had been prepared by Mr. W. E. Batho, but as the evening's proceedings would not admit of its being read, he kindly consented to enlarge it and read it at the next meeting of the Society.

This concluded the business, and the meeting was then adjourned.

Talk in the Studio.

MR. MORLEY'S CATALOGUE.—We have just received a copy of Mr. Morley's recent catalogue of new and second-hand apparatus of all kinds, presenting a singularly varied and extensive array of instruments. Such a catalogue must possess great interest for all contemplating fresh purchases.

DALLASTYPE.—Mr. Duncan Dallas has just issued his programme of the conditions upon which he is anxious to sell the secret of his process to five hundred subscribers at £20 a piece. We shall have a few words further on the subject shortly.

PHOTOGRAPHIC PIRACY.—On Tuesday, at Bow Street, Charles Urfer was charged on remand before Mr. Vaughan, upon several summonses, for selling and importing pirated photographic copies of engravings, the copyright of which belongs to Messrs. Graves and Son, the well-known engravers. In the absence of Mr. Lewis, Mr. Graves, jun., conducted the prosecution, and Mr. Silberberg defended. The case had been adjourned for the production of evidence to prove the importation of the photographs, and yesterday several letters to the

prisoner from the well-known firm of photographers in Berlin, Messrs. Saal and Co., were read; and these conclusively proved that the prisoner had been in the habit of importing these photographs for some time past. It also appeared that the prisoner was the agent who obtained the engraving, sent it to Berlin to be photographed, and then sold the copies in England. Mr. Vaughan, in summing up the case, said that over £30 had been found upon the prisoner, and he thought that if £25 of that money, together with the photographs found upon the prisoner's premises, were handed over to Messrs. Graves, that would meet the justice of the case. The £25 would be the accumulated penalty of £5 upon five different charges. This was agreed to by defendant's solicitor. Mr. Graves said his object was to prevent the piracy, and not to obtain money. There was also a second charge against the prisoner for selling, and having in his possession for the purposes of sale, a number of indecent photographs. This case was proved by Detective-sergeant Sayers and Detective Butcher, and the prisoner was committed for trial.

BATH OF ACETIC ACID BEFORE TONING.—The custom prevails largely amongst American printers of immersing the print, before toning, in a bath of one drachm glacial acetic acid in an ounce of water. Mr. Anthony, referring to the practice, says:—"Almost without exception, the American photographers use the fumes of ammonia in their printing. It is a fact that paper thus prepared retains sufficient ammonia to convert the free nitrate—or a portion of it, when the paper is soaked in a weak solution of acetic acid—into acetate of silver. There can be no doubt that the acetate is formed, as it is perfectly visible in the water. We do not know whether the plan of thus using acetic acid is adopted to any extent in England; but we can assure all who feel disposed to try it that it is a very important appendage to the ammonia fuming process, and almost as useful, from the fact that it saves very long washings before toning, enables one to save all his surplus nitrate, takes less gold in toning, and causes richer tones. Acetic acid can be replaced, and possibly with advantage, by other vegetable or organic acids. Citric and oxalic give especially fine results. The above assertions are founded on practical experience, as I have used the acid wash ever since I discovered its importance in our everyday work. I hope the photographers of England will not be as long before adopting the acid wash as they have been in the case of ammonia fuming."

COLLODIO-CHLORIDE PRINTS TURNING YELLOW.—Mr. H. J. Newton says:—"In reference to the fact that prints on collodio-chloride occasionally turn yellow I will state: A gentleman told me that he had been troubled a great deal with having his prints turn yellow. I spoke to him about using the acetate of lead for the purpose of eliminating the last traces of hyposulphite of soda. He said he had tried it, but did not succeed until he made a solution of acetate of lead to which a large proportion of alcohol was added, which enabled it to penetrate the film. Since he adopted that plan, he has not had a yellow picture." In our own experience these prints, if fixed and washed with moderate care, never turn yellow except where a substratum of albumen is used.—Ed.

REMOVAL OF NITRIC ACID STAINS.—These well-known yellow stains can be removed, either from the skin or from brown or black woollen garments, by moistening the spots for a while with permanganate of potash, and rinsing with water. A brownish stain of manganese remains, which may be removed from the skin by washing with aqueous solution of sulphurous acid. If the spots are old they cannot be entirely removed.—*Chemical News*

To Correspondents.

* * To AGENTS AND ADVERTISERS.—Next Friday being Good Friday, the PHOTOGRAPHIC NEWS will be published on Thursday, the 25th. Advertisers should send in their Announcements not later than Wednesday, the 24th.

MID LINCOLN.—Your negative is not distinctly fogged, but just verging on fog. It has the characteristic commonly produced by the use of a new, somewhat thin, and nearly colourless collodion, and a newly mixed iron developer. A little larger proportion of the ripe collodion will probably mend matters: the addition of a little of a developer which has become brown with age, or the addition of a little more acetic acid, will probably mend matters. The exposure is about right; possibly a little more might be better for the foliage.

J. T. ROLLA.—The Autotype Company, we believe, supplies tissue of various tints, and we have seen some of the warm tints you desire. It is probable that, on suitable terms, they could prepare you tissue of any desired colour. The use of permanganate for intensifying negatives made on carbon tissue and transferred to glass we had tried, and the deposit we obtained was the brown oxide of manganese. It is manifest that an attempt to tone carbon prints on paper would fail, as the permanganate would be decomposed by the size in the paper, and so discolour the whites. The toning, if it be found to succeed at all, must be effected whilst the image is on the glass or zinc plate on which it is developed before it is transferred to the paper.

PROGRESS.—You can only remove the nitrate of soda or of ammonia from a silver bath by precipitating the silver and redissolving it.

A. CHARKS.—Without a precise description of your operations it is impossible for us to form any idea of the reason why you sometimes obtain a picture, and sometimes nothing. The reasons why the film sometimes slips from your plate may be various, but the most probable reason is the use of a bath containing too much acid. With a tough, new collodion, and a too acid bath, especially when there is also some want of skill in manipulating, slipping of the film is not unfrequently a trouble. A preliminary coating of dilute albumen will prove a remedy. As a rule, rain water is not pure enough for the silver bath. Pure distilled water should be used.

J. N. W.—The writer of the article in question resides in Australia, and cannot, therefore, be easily consulted. It is clear, however, from his description, that, in the covering of the tent, top and sides are sewed together.

B. B. W.—Your simplest plan will be to describe your qualifications briefly in an advertisement in our pages, stating that you require a situation as printer. We cannot tell you what wages you can command: possibly from a guinea to thirty shillings a week. We do not find it, as a rule, convenient to examine specimens which are required to be returned.

R. T. WALL.—A negative about half-plate size is a good size for enlargement. Of the lenses you name we should prefer No. 4; No. 3 is also, we believe, a useful lens, but we cannot speak from personal experience. In either case a lens of about eight inches equivalent focus may be used for the work. You will find in our two last YEAR-BOOKS full details as to the preparation of emulsions.

O.—So far as we know, oleographs ought to be moderately permanent; but we have heard of cases in which the brilliancy of the colours has faded. Much will depend on the colours used in printing them. In such matters there is at times a temptation to use cheap fugitive colours, which have a brilliant effect at first, but which do not stand the test of time.

C. H. HOMES.—Hypo-sulphite of soda may be kept in solution, and will remain good if it have not been used.

C. E. F.—There are two or three modes in which salts of platinum can be used for printing purposes. A paper prepared with nitrate of uranium, and exposed to the light under a negative, and then immersed in a bath of chloride of platinum, will give an image in the latter metal. A process of this kind was described by Dr. Diamond in our last YEAR-BOOK. There is good reason to believe in the permanency of such pictures when carefully produced. But it has not been, as yet, tested fully by time, therefore we cannot absolutely say that the results will be permanent.

SILVER.—The silver solution required for securing an electro deposit of silver on copper is made by dissolving chloride of silver in a solution of cyanide of potassium. We cannot possibly, however, give you full details of the electrotype process in this column. Procure a hand-book of electrotype manipulation, which will cost you about one shilling.

W. A.—Toning may be effected with a solution of absolutely neutral chloride of gold without any addition. On the addition of acetate of soda to ordinary chloride of gold the acetate of soda is slowly decomposed, the base going to the free hydrochloric acid and neutralising it, whilst a trace of acetic acid is set free, and is an advantage rather than a disadvantage in toning. You should not write questions to the Editor in the letter addressed to the Publisher. It causes delay, inconvenience, and risk of being overlooked.

MR. HOWARTH'S address is 3, Thornton Road, Bradford.

R. HOLOATE.—Thanks.

A. W. ADAMS.—Letter forwarded.

H. BRUYERE.—Thanks; in our next.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

Mr. GEORGE SMITH,
Photographic Group—Messrs. Moody and Sankey.
Photograph of Mr. Sankey.
Photograph of Mr. Moody.
Messrs. NEWHAM & Co., Bournemouth.
Photograph of Earl of Kintoul.
Messrs. SYMONDS & Co., Portsmouth.
Photograph of Sir James Elphinstone, Bart.

The Photographic News, March 25, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

ABOUT PYROXILIN, SOLUBLE AND INSOLUBLE, AND ITS STABILITY.

THE extensive employment of guncotton, nowadays, by photographers and surgeons, and especially by miners and military engineers, renders it a matter of absolute necessity that we should be thoroughly acquainted with the properties of so powerful an explosive. It has always been an unfortunate circumstance connected with its investigation, that no sooner have chemists made some sort of progress in their experience of guncotton, than a lamentable accident in its manufacture at once puts a stop to—or, at any rate, seriously retards—the further study of its properties in the laboratory. In this country we have had two very serious accidents with guncotton: at Messrs. Hall's powder mills at Feversham, very soon after the material was invented, and recently at Stowmarket, an occurrence which will still be fresh in the minds of many of our readers. Other minor mishaps have from time to time occurred, but it is due principally to the two incidents we have mentioned that suspicions have grown rife in this country concerning pyroxilin. Dr. Vogel's recent remarks upon the subject, which were given in our columns last week, show how much uncertainty still exists in the minds even of chemists about the liability or not of pyroxilin to spontaneous decomposition, and this is not the only point upon which uncertainty still exists. There cannot be a doubt, of course, that some kinds of pyroxilin are liable to spontaneous change, but then it is argued that the material in these cases was not properly prepared in the first instance.

When Schoenbein made his discovery first of all, only one kind of pyroxilin was recognised, and it was not till some time afterwards that it was shown there existed two sorts: one a perfectly soluble cotton, which photographers and surgeons make use of in collodion, the other containing more nitrogen, and being far more explosive. This latter, which is termed by chemists tri-nitro-cellulose, is soluble only to a limited degree, for if shaken up in a mixture of ether and alcohol only one-sixth of its bulk, at the most, is dissolved. Indeed, the degree of solubility that tri-nitro-cellulose possesses is one of the tests of its purity, and it is held that if more than the proportion we have stated is dissolved on treatment with the solvent mixture, then the material has not been properly prepared.

Returning, however, to the question of whether collodion guncotton and tri-nitro-cellulose are perfectly stable compounds, or whether they are, under some circumstances, liable to spontaneous decomposition or combustion, we approach a point which is hardly so clear as it might be. Professor Abel, the chemist of the War Department, who is one of our greatest authorities on the subject, would, we doubt not, unhesitatingly answer no to the question. If the material is properly manufactured, and the cotton has been thoroughly cleansed of all impurities, to begin with, and is well purified from the acid afterwards, he has over and over again stated his firm confidence in its stability. Other chemists have also expressed their thorough belief in the stability of pyroxilin, and especially of collodion cotton, if manufactured with care and precision; but here, unfortunately, comes a condition which cannot always be guaranteed. The specimens of guncotton which have to our personal knowledge become decomposed, may, of course, have been imperfectly manufactured; but, we would ask, how are we to guarantee a perfectly pure and durable material? The catastrophe at Stowmarket was ascribed, it will be remembered, to the addition, through malice or accident, of acid after the cotton had gone through the conversion process; and this acid, remaining in the cotton when dry, led, as may easily be imagined, to its ignition. Since that

time a very safe precaution has been adopted, which it would be well for all photographers who have a large stock of pyroxilin by them to profit by. It is simply to keep the material wet from first to last, and to store it in this condition. Under these circumstances accidents can never arise, and the drying, which is dangerous if not properly conducted, should be undertaken with small quantities at a time. Any one who has seen a red hot iron bored into a half-pound block of moist guncotton, will be at once convinced of the harmless nature of the substance under these conditions, and engineers and miners are now enabled, thanks to the valuable discovery of Mr. E. O. Brown, of Woolwich, to make use of it in this condition, whether for the purpose of mining or blasting. So valuable, indeed, has guncotton proved for work of the latter description, that the Arctic Expedition, under Captain Nares, will make use of this explosive for blasting the ice, should the ships unfortunately be unable to free themselves from the masses of ice in any other way. For Arctic work pyroxilin has the great advantage over such blasting agents as dynamite and other nitroglycerine compounds, that when in a frozen condition, it does not become more dangerous to handle; while nitroglycerine, on the other hand, when congealed at a low temperature, needs to be employed with extreme care.

The lamentable death of Mr. Mawson, whose collodion is so well known to us all, at Newcastle some years since, was due, it will be remembered, to the explosion of some nitroglycerine which had become frozen. Keeping guncotton wet, besides rendering it at once an innoxious compound, has a tendency, also, to promote its stability; if it be of a suspicious nature, and when conveying it in large quantities from one place to another when any risk attends its transport, we earnestly recommend the moistening of it first of all. Another plan for reducing the explosive power of photographer's pyroxilin would be for chemists to manufacture it in solid blocks, pressing the short fibre of the guncotton, when moist, into little pellets or slabs, as is the case with guncotton used for firing, for in this form the material, even when dry, is comparatively harmless, and burns fiercely rather than explodes, supposing it is not confined.

We have heard that the Stowmarket Guncotton Company have intentions of manufacturing soluble guncotton for photographers, this being now almost a waste product at the works, because, as we have just said, a large amount of soluble cotton existing in tri-nitro-cellulose renders the latter unfit to be used as an explosive. As all the guncotton manufactured at Stowmarket is reduced to pulp and then compressed, there is no doubt that the Company would produce their photographic pyroxilin in the form we suggest.

At Faversham, where another guncotton factory exists, calling itself, we believe, the Guncotton Powder Works, the material is also reduced to a fine state of division, for the double purpose of effecting its washing more thoroughly, and being able to compress it into any desirable shape. Instead of the cotton being reduced to pulp, however, as is done at Stowmarket, they grind the fibre between millstones, and in this way break up the cellular structure of the cellulose, and prevent it from retaining any trace of acid when finished; for it is the generation of acid fumes that is generally the first step towards the decomposition of guncotton; and any photographer purchasing pyroxilin should always refuse to accept a material of a reddish tint, especially in the event of his not wanting to use the material at once in the manufacture of collodion.

WUNDER'S COLOURING PROCESS.

BY FRITZ HAUGK.*

NOTWITHSTANDING the many favourable opinions which were expressed regarding this process in the photographic

* *Photographische Archiv.*

journals at the time of its publication, it has never received any extensive application; and the remark of M. Wunder, that after a few years (the process was made known in 1872) all high-class studios would practise the method, has turned out to have been at least premature. There can be no doubt that the process merited more attention than has been given to it, for where the photographs have been placed before the public, they have been well received, and the extra price asked for them has not been grudged.

This fact has caused me to give a little information about the process, and the method of carrying it out, although I cannot say whether M. Wunder still proceeds in the way he used, and which I have here described. From a communication, however, which I have recently received, I may assume that if he does not work exactly in the same manner as heretofore, the modifications he makes use of are of but minor consequence.

So far as regards the practice of the process, it is easily carried out. The photograph to be coloured must be toned a little more than is usually the case, so that it may not be of a brownish tint, but rather of a bluish-black colour. After the photograph has been fixed in the ordinary manner, and washed thoroughly, and dried, it is rendered transparent by the application of a varnish made up according to the undermentioned formula:—

French oil of turpentine	...	90	grammes
Mastic, finest quality	...	15	"
Venetian turpentine...	...	3½	"

After the picture has been treated with this mixture and dried, it is placed face downwards upon a flat surface, such as a glass plate covered with a sheet of paper, and coloured vigorously on the back with honey or gelatine colours. So as to be able to judge better of the effect of the colouring from time to time as the work is proceeded with, the image is turned over and looked at from the face, upon a basis of white paper. If the picture appears under these circumstances to be sufficiently coloured, it is ready to be mounted. A card mount is coated very evenly with a solution of gum arabic in water. This first coating is allowed to dry, and then a second is applied, and while this is yet moist the coloured photograph is pressed on to it in the ordinary way, and the picture carefully pressed down by means of a soft linen cloth. Perfect adhesion is brought about by gently pressing the photograph down with the cloth. The picture is not put through a rolling-press, but allowed to dry in this condition, the edges of the card being cleaned from gum by means of a moist rag.

Should the colouring show any lack of uniformity afterwards, this may be easily rectified upon the finished picture.

THE PRACTICAL PRINTER IN AMERICA.

XX.

WASHING AND ACIDIFYING PRINTS BEFORE TONING.

It will be seen in the following chapter that Mr. Hearn refers to the practice of immersing prints in acetic acid before toning as a matter of course. The custom obtains almost universally in America, whilst in this country it is comparatively little practised, although it had its origin here. About fourteen years ago, soon after the use of the alkaline toning bath had become quite general, irregular mottled toning, called mealiness, was a common trouble. Mr. Fry, if we remember rightly, introduced the bath of dilute acetic acid previous to toning as a remedy which proved efficient for this trouble.

Mr. Hearn's practical remarks on the action of acetic acid are excellent; but he does not seem quite clear as to the theory of its action. It in reality facilitates the toning operations instead of retarding them, whilst chloride of sodium would have the opposite action. In toning, it is necessary that chloride of gold should be decomposed, so as to precipitate the gold on the print. The chloride of

silver and free chloride of sodium resulting from the use of the ordinary salt bath will certainly not facilitate the decomposition of the chloride of gold, whilst acetate of silver by double decomposition, and acetic acid as a reducing agent, will both aid in reducing the gold. Hence the value of the acetic acid bath.

"Next in order comes the washing of the prints although in many galleries the acidifying of them is done first. It is a question whether it is best to place the prints first in the acid water or not, and there are many photographers that believe in washing them first; and then, again, there are many that believe to the contrary. It is not in my mind a matter of so much importance, but for several reasons I am most in favour of washing them first; and so I will commence with the washing.

"It was supposed by many photographers, two or three years ago, that the washing of the prints was a matter of considerable time, and consequently they would let their prints wash half an hour in running water, moving them occasionally with the hands. Within the last year or two, however, the photographic printers have found out that such long washing is not only unnecessary, but injurious to the prints; and at the present day, in many of our first-class galleries, this preliminary washing is done in a few minutes. The way we should advise our brother printer to wash his prints is as follows:—Take a half-sheet dish—although any other, if large enough, would do as well—and pour into it lukewarm water, until the dish is about one quarter full. Now place the prints in, by letting a few drop out of your left hand at a time into the dish, while, with your right, you gently and quickly push them under the water, until you have placed the whole batch of prints in the bath. Again, do this as quickly as possible.

"I have recommended to let a few (three or four) drop from the hand at a time in the water, because beginners are apt to get some of the prints wet (and let them stay in the hand for some time in that condition before they are placed in the water), if they were to take them from the left hand with the right one, and then place them in the water as they might want. By being very careful, however, they can do it. The objection to getting the prints partly wet and then remaining in that state, even for a few seconds (say eight or ten seconds), before they are wholly submerged in the water, is, that where the water has touched them, they will turn red; and if they are thus partly wet by the water, then, after you have placed them in the dish, they will show spots redder than the other parts of the prints, which will sometimes be very troublesome in the succeeding operations. After the whole batch of prints that are to be toned are placed in this bath of warm water, move them about briskly for about five minutes, and then gently pour the water off into a barrel, leaving the prints to lay flat on the bottom of the dish. Then rinse them with a little more water, and pour this also into the barrel.

"These first two waters we save, and throw down the silver in them, by sprinkling a little common salt in the contents of the barrel, upon the addition of which the silver in the solution will be deposited on the bottom in the form of chloride of silver. Upon adding salt to the solution it will turn milky; whereas, before it was added, the solution was of a cold slaty colour. When this chloride of silver is thoroughly deposited, then draw off the clear water by either a syphon or a faucet, as may suit the taste of the printer.

"Before taking for granted that the silver in the solution is all precipitated because you have previously sprinkled salt in the barrel, the solution should again be tested by a pinch or two of salt, and if there is no more precipitate, then the silver is all precipitated, and the liquid can be drawn off without any further delay. When you have rinsed the prints, wash in one or two other changes of water, which you need not save, and then they are ready to be placed in the acidulated water. When the prints are in

the first change of water the washing is done quickly by permitting them to come to the surface, and then gently pushing them down again to the bottom. The prints are washed more thoroughly and quickly in this way than in any other. The time required to do the above washing, after the whole batch of prints are placed in the bath, is only from five to ten minutes.

"Now, since the prints are sufficiently washed, they are ready to be placed into the acid water; but, before we do so, we will pause and consider for a few minutes the object of doing this.

"It has been supposed by many printers, and in fact that is the general opinion at the present day, that the prints are placed in this bath of slightly acid water for the simple purpose of making them red, so that they will be able to watch the toning, and also to tone them better. Now this is partly so, but it is by no means the *principal* object of placing them in the bath, as we will presently endeavour to show.

"If our only object in placing the prints in this bath was to make them simply red, why should we not, as was formerly done, place them in a bath of salt water, and thus redden them, as it will do the work as quickly, if not quicker, than the acetic acid does, besides being very much cheaper?

"The answer from some of these printers may be that they cannot obtain such nice tones as they could if the prints were 'red up' with acetic acid: and, if that is so, is it not evident that there is something in the action of the acetic acid on the prints that renders them better for the toning operation than the action of the salt on them does?

"The action of the salt water on the prints converts the remaining silver left in the prints after washing into the *pure chloride of silver*; whereas before, part of the silver on the surface of the prints was the chloride, albuminate, and the nitrate, for it must be borne in mind 'that the salt in the paper, when it is floated upon the positive bath, takes up the silver it needs, and forms chloride of silver,' which is more sensitive to the light than the nitrate, 'and the albumen of the paper takes up some, and forms albuminate of silver;' and, besides this, 'there is some more absorbed merely mechanically,' which is properly the nitrate. (Our attention was first called to the fact we have just explained upon reading, a couple of years or so ago, the action of the positive bath on the albumen paper, when floated upon it, in Dr. Vogel's *Handbook of Photography*).

"Thus you see that all of the silver that was on the surface in different forms is now reduced to the same form, viz., *pure chloride of silver*.

"Now if you were to place the prints in a very diluted bath of acetic acid instead of salt, then the remaining silver in them will be perfectly converted into the *acetate of silver*,* if they are permitted to remain in the bath long enough for the acid to overcome the other natures of the silver, and that is why I have below recommended the prints to remain in the acid water ten minutes, for the acid to do its work well; and that is also the reason why (if the prints stick together for any length of time), *even if they have once been wet all over with the acid water*, the prints at those parts where they had laid close together *will not* be properly converted into the acetate of silver, and will not tone well, although they may not have changed colour any—i.e., those parts of the prints which may be stuck together will be full as red as the rest of the prints, and thus to a careless eye may be all right; but in the toning of them, the printer will perhaps wonder what makes some of them tone so much better than others, although in the distribution of colour on the surface they seem to be all alike.

"The acetate of silver is worked upon better by the toning solution than either the chloride of silver or the mixture that composed the silver on the prints before they were placed in the acid or salt water (being chloride, albuminate, and nitrate).

* It must be borne in mind that the paper having been fumed, there will not be any difficulty in forming acetate of silver, as would be the case if only free nitrate were present in the prints.—Ed. PHOTO. NEWS.

"The proof of the above can be observed by the toner as he tones the prints that have been 'red up' in either the salt or acid water; and then again as he tones those which have not been 'red up' at all, but simply washed.

"I do not mean to give the young beginner the impression, however, that prints that have been placed in the salt water, in lieu of the acid water, will tone *badly* in the toning baths, for, on the contrary, they will tone *very fairly*, as the good old-fashioned tone (good if it is old) will show; but I do mean to say that *better tones* can be obtained with the use of the acid water, *provided the conditions are alike*. An excellent toner may take prints that have been placed in salt water, and obtain better results than an indifferent toner would with prints that have been placed in acid water.

"The quantity of the acetic acid required is just sufficient to properly convert the remaining silver in the prints into acetate of silver, as has been said before, and no more. I use generally about an ounce of the acid to the gallon of lukewarm water. I use lukewarm water because it will more quickly do the work required than cold water.

"In Germany and England glacial acetic acid is used; but when that is used, only the slightest quantity is required, as it is very much stronger than the acetic acid No. 8. This acid (glacial acetic) is not used at all, I think, in this country, and when the acetic No. 8 can be obtained it had better be used, as the glacial is very expensive, more so than it is proportionally stronger.

"When you commence to make your acid bath, place the lukewarm water first in the dish you are going to use, and, after measuring out the quantity of the acid in a small vial, pour it into the water at different places, and then, with your hand, stir the water well for about one minute, so as to get the acid thoroughly mixed with the water. Now place the prints into this bath as quickly as possible, in the manner described in the preceding chapter, i.e., by permitting two or three to fall at a time from the left hand, while with the right they are separated as quickly as possible.

"When you have placed every print in the acid water, then keep them in *constant* motion for *ten* minutes, for the reason above mentioned (viz., that the silver in the paper will be equally converted into the acetate of silver), and then pour off the acid water and *save it* (for this acid water has released still more silver from the prints), and then wash the prints in three or four more changes of water, so as to remove the bad smell of acetic acid from them. It is very necessary that the prints be washed well after acidifying them, because, if the superfluous acid water is not well washed from them, *false, deceiving tones* will be obtained in the toning bath, which will in a great measure be destroyed in the further operations with the prints. The tone will be a superficial and uneven one. The prints are finally sufficiently washed for the toning operations when, upon smelling them, there is only a very slight vapour of the acetic acid given forth."

ART-CRITICISM.

BY W. NEILSON.*

Retouching.—By "retouching," I mean painting lights on the negative, or "modelling." It almost seems presumption to speak against it; for no fashion has been more prevalent or more generally admired since the graceful crinoline went out of date. It has even been exalted into the "artistic touch" which gives brilliancy to a photograph; reminding one somewhat of the artistic touch a girl gives her cheek when she dresses in the highest height of fashion, and becomes brilliantly vulgarised. It is but common humanity to sympathise with the next generation when they shall see the general run of the brilliant "retouches" of their fathers looking as if the originals had been touched with leprosy. It is altogether a mistake.

* Concluded from page 134.

Art is not to be juggled with. Trick and tinkering of every kind is alien to its nature. Every art is complete in itself; indebted to itself alone. What would you say of the painter who could not finish his picture without calling in extraneous aid, wholly apart from brush and pigments? You would say either that painting is an incomplete art—that is, no art at all—or that the painter was incompetent. In like dilemma, the photographer who resorts to the brush casts a slur either on himself or photography. Either the one is not a true art, or the other is not a true artist. Perhaps it may be said that certainly is true; yet retouching beautifies the photograph. To this I would reply, in the words of the "Iron Duke," when George IV., who had come to believe that he led the charge at Waterloo, appealed at a dinner party to the Duke of Wellington if that were not the case, the Duke replied, "I have heard your Majesty say so before."

Photography, like every other art, must act solely by its own law, having its own idiocracy or peculiar constitution, according to which it can render every suitable requirement of light and shade. It is difficult, no doubt; but difficulty is the boast of art and test of the artist. Photography should not imitate the effects of painting or chalk drawing. To imitate is to confess want of originality—the resource of incompetence. Photography, as different from other modes of representation, should be true to itself, and give its pictures wholly, according to its own idiocracy, in a subdued tone of graduated lights and shades, in which alone its charm consists. It should work, so to speak, in a minor key. If a painting may be compared to the effects of a sunlit view, photography may rather be compared to the effects of a moonlit view. Take away from it this difference from other modes of representation, its subdued rendering, and you leave—what? Brilliancy, which, translated into the vulgar language, means "chalkiness."

I object, then, to retouching:—1. Because by imitating the high lights of painting it departs from the idiocracy of photography. 2. Because introducing a high light destroys the subdued effect of the graduated scale of shades peculiar to photography. 3. Because it destroys the texture, always producing more or less of a chalky or woolly effect. 4. Because it interferes with the likeness. If we could have a photograph of Shakespeare, would you wish it to be retouched. No. And why? Just because it would interfere with the likeness. Every man should be represented as what he is, and not what the retoucher thinks he should be; unless the man, aspiring to the *beau ideal*, is content to be turned out as an ideal bean.

But it may be said there are great authorities in favour of retouching. Great authorities are not always infallible, especially if from some peculiarity of taste, or wish to suit the public taste, they load their pictures with the flashy details of furniture and millinery, so that their pictures might almost be called an exhibition of the same, with a figure into the bargain.

But if the truth that photography, as an art, should rely on itself alone requires an authority, I name O. G. Rejlander. Requiring no adventitious aids, and scorning meretricious effects, he relied on his art alone; and, with admirable taste, his innumerable and widely-differing compositions are pervaded with the simplicity of excellence which ever characterises true genius. When the taste that rejoices in the brush has passed away he will be regarded as pre-eminently the first photographic artist of his day. If ever photographer stood on the higher platform he is the man. Latterly Rejlander never retouched.

These remarks are, of course, not intended to bear upon professional photographers, many of whom, I know, have to do what they dislike in order to please their customers. Trade, as well as art, has its prerogative—"Who live to please must please to live." But amateurs, at least, are freemen. We know that there are men among them of taste as well as skill; and it is for them especially—if they can forego the easy popularity that is acquired by a few

dabs of the brush—to rely upon their art, and show the subdued style of beauty peculiar to photography, without which it has no pretence to be called an art. Already there are prophetic signs. I am told that in Germany a reaction is taking place, and that retouching is beginning to be regarded as a mere "dodge," unworthy of any man who has the capabilities of an artist.

Life-size heads.—Mr. Crawshaw has rendered great service in calling attention to the capabilities of the lens. Not having seen the pictures which gained his prizes, I can merely say that I believe the judges were conscientious in their verdict, and that the pictures are excellent, even making allowance for the touch of the fashionable brush. That life-sized heads should be confined to the portrait painter I think can be proved by the fundamental principle of art. But, passing that, there are two difficulties in taking direct life-size heads. The one is that few skins can stand the near scrutiny of the lens without leaving on the negative many unseemly spots. Skins that show no freckles to the eye often do so to the lens. The other difficulty lies in the point of the nose. This very prominent feature is very apt to have, whether it be curved downwards or upwards, a prolongation at the point, as if nature intended humanity to be led by the nose, which it very often is. In most positions of the head this nasal knob perks itself unduly into the light, which, falling at a certain angle, becomes reflected or deflected with an amount of glare that causes exaggeration in the negative. For the same reason, though the hand be in perfect focus, the glaring fingers come out enlarged. This happens in small photographs also. Of course there will be distortion if the focus of the lens be too short for the occasion.

As somewhat in illustration I have laid before you three of the pictures I sent to the exhibition. As they were neither retouched nor touched they would, of course, look flat and dull beside those made brilliant with the "artistic touch." Since the exhibition the print of the large head has had the spots on cheek and forehead touched, giving it a more finished look. Several artists have seen it, and found the drawing correct, save a slight width at the nasal knob. They also agreed that it has a richness of effect not found in enlargements, which are, more or less, either chalky or flat. The two five-inch heads have not been touched. I have attempted in them to illustrate what I conceive to be the subdued tone proper to photography, wholly differing from the effects of painting and chalk drawing. The one is delicately lighted to show the texture of the face; the other shows the texture of the hands, a part that is apt to be defective in photographs. I asked the artists I have alluded to if the heads would be improved by heightening the lights. The reply was, No! Indeed every artist I have talked with speaks of retouching with abhorrence.

In expressing opinions in a paper of this kind one is apt to appear to dogmatize. If I have done so it is partly owing to the fact that any artists I have had an opportunity of conversing with on the subject have substantially agreed with what has been advanced.

In concluding, I am aware an opponent might say, "You have, for the most part, merely expressed opinions without meeting objections which might be brought against them. My reply would be, 'I grant it, sir. One can't do everything in half-an-hour. I have merely tried to shunt you on to my line; and it will do you no harm to look at things from that point of view, and indulge in a little contemplation without partiality, and, if possible, without prejudice.'"

THE ART OF POPULAR ILLUSTRATION.

BY HENRY BLACKBURN.*

WOULD it, then, be too much to ask of those who cater for and really create the public taste, that they should give us one of two things, or rather two things, in our illustrated newspapers, the real and the ideal?

* Continued from page 147.

1. Pictorial records of events in the simplest and truest manner possible.

2. Pictures of the very highest class that can be produced on wood, and printed with the type.

If I were pressed for examples of excellence in each division as issuing from the press to-day, it would be difficult, and might seem invidious, to select them. Mr. Simpson, of the *Illustrated London News*, making a sketch on a cigarette paper as he walks to prison between two *gens d'armes*, ready to smoke or to swallow it on an emergency, is a good picture of artistic activity in this direction; but speaking generally, I would say that, in the first division—i.e., "the real"—some of the best sketches from the seat of war have appeared in the *Illustrated London News*, and in the *Monde Illustré*, published in Paris. They do not fulfil all the conditions asked for, and even they sometimes lack the simplicity and decision of touch which we hope to attain by training.

In the second division, "the ideal," the public need not be reminded that the *Graphic* newspaper is producing work of a higher artistic order than anything we have been accustomed to in newspapers. The illustrations by Small, C. Green, Herkomer, H. Allingham, and others, which have appeared lately, reach, I believe, both in drawing and engraving, in composition, colour, and in all technical qualities, the highest standard of excellence yet achieved. In this branch of illustration there is legitimate scope for both artist and engraver; but it is a question of taste how far events of the day should be treated imaginatively, such, for instance, as the accident on the Matterhorn, depicted by Doré, and the burning of the *Cospatrick*, by Durand. Some will think that such scenes should be left to the historian, be he painter or man of letters. In illustrations to novels and tales in newspapers and magazines, there is often more thought given to producing a work of art than to illustrating the text. The result is generally satisfactory to the public, but it is scarcely illustration in the true meaning of the word. Portraits, although they have been well described as the "ideal biography of the man," belong to the first division, the real, and in no branch of illustration do our newspapers more legitimately excel. The portraits of Dr. Manning, and of Carlyle, which have appeared lately, are remarkable examples of what may be accomplished, both in drawing and engraving on wood, for the weekly press.

Here, then, are two opposite methods of illustration, which only require to be kept distinct, each in its own place, and our interest in them would be doubled. We ask first for a record of news, and then for a picture-gallery, and to know, to use a common phrase, "which is which."

In the illustration of books, I would remark generally that the present fashion of drawing and engraving is too elaborate, the cost of which discourages publishers, and deprives the public often of what it would care to see. Instances of this occur every day. I saw lately the author of a book of travel and exploration lay before his publishers a collection of sketches, photographs, and the like, which he had taken years to collect. To have seen these, or most of them, presented in the form in his book, would have been a valuable addition to our store of knowledge. But the publisher was wise, from a business point of view, and out of some fifty of the most important subjects he selected ten, and had them drawn and engraved in the best drawing-room manner. The book is a success financially, and everybody is satisfied excepting the author himself, who knows that perhaps half the interest of that book lies in a drawer in his own chamber—waiting for the millennium!

Next, as to the processes for reproducing drawings, especially those adapted for the fac-simile reproduction of sketches. During the past few years so many processes have been put forward for producing drawings in relief, for printing with the type, that it has become a business in itself to test and understand them. First, as to wood

engraving. I need not tell the practical part of my audience that on the 10th of March, 1875, the best known process is wood engraving; at least, it is the best for fac-simile reproduction of drawings, as at present understood in England, whether they be made direct upon the wood or transmitted by photography. There is no process in relief which has the same certainty, which gives the same colour and brightness, and by which gradation of touch can be more truly rendered. Nobody knows, nobody ever will know, how much the engraver has done for the artist. "For good or for evil," it may be said; but I am thinking now only of the good—of occasions when the engraver has to interpret the artist's meaning, and sometimes, it must be confessed, to come to the rescue and perfect imperfect work. The artist who draws for reproduction by chemical and mechanical means is thrown upon his own resources. He cannot say to the acid, "Make these lines a little sharper," or to the sun's rays, "Give a little more light;" and so, as we cannot always have good wood engraving, as it is not always cheap enough or rapid enough for our needs, we endeavour to draw in positive black lines exactly what we want reproduced, either a sketch in line or a diagram, or a more finished drawing, with tints obtained as in steel engraving, and resort to one of the photographic processes by which a stereo block can be produced, if necessary, in six or eight hours.

A wonderful and startling invention is here, worthy of a land of enchantment, which, without labour, with little more than a wave of the hand, transfixes the written thought, and turns it into a monument; by which the most delicate and hasty stroke of the pen is not merely recorded in fac-simile for the eye to decipher, but it is brought out in sharp relief, as bold and strong as if hewn out of a rock. Here is an argument for doing "the best and truest work we can," a process that renders indestructible—so indestructible that nothing short of cremation would get rid of it—every line that we put upon paper: an argument for learning, for purposes of illustration, the touch and method best adapted for photographic reproduction by the press. As to the relative value of the different photographic relief processes, that must be decided by experts. Speaking generally, I may say that there are six or seven now in use, each of which is, I am informed, the best, and several of which I know to be applicable to cylinder machines in the same manner as a metal cast from a wood block. Improvements in these processes are being made so rapidly that what was best yesterday will not be the best to-morrow; and it is a subject of such importance that it might be worth while to devote a special evening to its consideration.

In answer to the question—perhaps on many lips to-night—"Has anything worthy of the name of an artistic result been produced by these relief processes?" I answer emphatically, "Yes;" and that the results obtainable are, as yet, only half revealed. Drawings reproduced in relief by photographic processes differ curiously from each other, and all, of course, differ widely from wood engraving, which is never in absolute fac-simile. As adjuncts to, but not as substitutes for, wood engraving, the processes have great value, both in time and economy, and the results give us sometimes a quality of work which, for technical reasons, cannot be accomplished by the graver—a quality for which there is no other word than artistic. Some of the blocks are deficient in relief, and in the bearing up of the fine lines; but some have answered admirably, and have had as many as 100,000 impressions printed from them. The specimens put forward by the promoters of the photo-relief processes are very unequal; some are very good, and some, I must admit, are very bad indeed. They say, "Give us good work, and we can reproduce it;" but they want something more than this; they want drawings that will bear being reproduced mechanically; they want something, in fact, which, for want of practice, few artists are able to give.

(To be continued.)

The Photographic News.

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THE ALBUMEN-BEER PROCESS.

THE testimony borne by Captain Abney to the simplicity of the Albumen-beer Process, and the sensitiveness and trustworthiness of the plates under circumstances of special importance, must invest the subject with unusual interest to all dry-plate workers. We have already published copious details of the process, and we give to-day the *resume* of the operations used in the Transit plates. To the full statements thus laid before photographers we are enabled to add a few further hints of value, obtained from Captain Abney in response to questions which arose to our mind after hearing his paper and examining the very fine quality of the negatives the process presents.

First, as regards the albumen. In Captain Abney's experience, dried albumen answered in every respect as perfectly as albumen from fresh eggs; and in view of the excellence, convenience, and economy of this preparation, he expressed a conviction that it might with advantage supersede fresh eggs in the majority of photographic applications. The primary difficulty standing in the way of this arises from the fact that samples of dried albumen vary, some being perfectly soluble, whilst other dissolve less freely, and leave some insoluble residue, a fact which at once introduces uncertainty as to the strength of the solution. Captain Abney, in his paper of Egyptian experiences read before the Society, refers to a sample from one maker as always dissolving perfectly. This sample, we ascertained in the interests of our readers, is prepared by Mr. Thomas, of Pall Mall. It dissolves perfectly in cold water in a few minutes, fifty grains of it in one ounce of water furnishing, in Captain Abney's experience, a solution equivalent in all respects to the white of a fresh egg. According to the instructions of the maker, if we remember rightly, seventy-five grains per ounce should be used to produce a solution equivalent to white of egg; but Captain Abney never found it necessary to use more than fifty grains.

One of the most frequent enquiry which has reached us as regards this process has had reference to the quality of the ale used. Captain Abney's answer to this question is: "Any ale, so far as I know. I have used many kinds with good results, but we use, by preference, Tennant's ale." A good pale ale, moderately rich in malt and hops, is always found to answer well. An important point, however, requires attention. When it is least fit for drinking—that is, when it is quite flat—it is best suited for use in photography. Captain Abney found it necessary, with bottled ale especially, and with draft ale if it were at all brisk, to allow it to stand some hours in an open vessel, sometimes heating gently, in order that all the carbonic acid should escape, otherwise this, when brought into contact with the ammonia, would form carbonate of ammonia. Another point in connection with

the ale it is important to observe: it should never be mixed with albumen solution until immediately before use, and any remaining over should be thrown away, as its use would only issue in uncertainty and probable failure. The reason is simple: if the solutions are suffered to stand for a time after being mixed, a precipitate is formed by the reaction between the tannin in the ale and the albumen, and two elements in the success of the process, tannin and albumen, are, to a certain extent, eliminated from the preservative.

The mode of modifying the physical condition of the collodion by the addition of water, described by Captain Abney, is important. The method is a very old one, but it has not received sufficient attention. In most dry processes it is of great value, and also frequently in the wet process. A dozen years or more ago Mr. Window described in the *PHOTOGRAPHIC NEWS* a dry process without preservative, yielding very sensitive and certain plates. An important element in the success of the process consisted in adding water to the collodion to the utmost point possible, without rendering the collodion glutinous and its film reticulated. Many persons tried the process and failed, and in every case where we could trace the operations we found that the process of watering the collodion had been neglected as unimportant and troublesome. In working large plates by the wet process, especially in hot weather, this treatment of the collodion is most valuable. When, owing to the horny repellent character of the film, matt silver stains are troublesome, watering the collodion judiciously is an almost certain cure. The procedure is one, however, which requires care and judgment. The best plan is to take a portion of the collodion to be treated, adding distilled water at the rate of two or three drops to each ounce at a time, shaking well, and then, after allowing the bottle to stand for a time, trying a plate. When the extreme verge has been reached, and crapiness begins to be apparent, a little of the unwatered sample may be added to restore working conditions and get rid of crapiness. There are two different defects produced by too much water not always present together. The most common is the production of a reticulated, crapy film. This is easily removed by adding a little untreated collodion. The other defect is an irregular glutinous consistency, giving an irregular, lumpy film. This is not always got rid of at once on adding more untreated collodion. When once it is produced, it sometimes happens that the addition of much fresh collodion is not remedial. Time alone, in conjunction with the fresh collodion, will effect a cure.

In the albumen-beer process, Captain Abney finds the watered collodion invaluable. It will readily be seen that such collodion should be valuable in all dry processes. The film prepared with such collodion is much more permeable by water than a film from unsophisticated collodion, and, consequently, much more readily permits the removal of free nitrate of silver by washing. It also permits the ready permeation of the preservative and sensitizer—a condition manifestly of value; and it receives, and absorbs the aqueous solutions used in developing easily, so making the process of development almost rapid and easy as that of a wet plate.

ENAMELLED OR "GLAZE" PHOTOGRAPHS.

THE enamelled surface for portraits appears to be the rage amongst American photographers at present. A substitute is proposed in the *Photographic Times* in the use of what is termed "diamond glossy" paper and collodio-chloride of silver. The paper in question appears to be the same as ordinary glazed or enamelled paper produced by means of a pigment and a glazing process. We have frequently used it for collodio-chloride printing with great advantage. It gives a fine surface and great delicacy in rendering every detail in the negative.

The following method, given in the same journal as the

mode employed in Frederick's studio (one of the first portrait establishments in New York), may afford good hints to those who have not yet succeeded in producing enamelled surfaces satisfactorily.

"Have your glass free from bubbles and scratches—plate glass, size about $5\frac{1}{2}$ by $7\frac{1}{2}$ inches for cabinets. Clean well, and run a little streak of gum around the edges. This precaution must be taken, or else the picture will leave the glass before it should do so. When the gum is dry, it is ready for the collodion.

Collodion.—Ether, alcohol, glycerine, cotton. Coat the plate with this, and set away to dry: half an hour will be enough.

Gelatine No. 1.—Best French gelatine ... 1 ounce
Water 12 ounces

Let the gelatine soak in the water twelve hours, then heat either by sand-bath or glue-pot principle; never let the heat be over 130° Fahrenheit or under 115° . Place in the solution, one by one, the pictures which you wish to enamel. Take your collodionized glass and warm it slightly on the back; then take a picture from the gelatine solution and lay it carefully on the glass, face down; rub the back lightly with a piece of cotton flannel, in order to remove the surplus gelatine on back and between the glass and picture. Let the surplus thus removed run into another dish, then lay the glass down flat, and keep on until all the pictures are thus placed, and let them remain half an hour; they are then ready for the next process.

Gelatine No. 2.—Gelatine same quality ... 2 ounces
Water 8 "

Soak in this solution the cardboards for backing from five minutes upwards, and mount on back of pictures, in the same manner that pictures were placed. These mounts should be thin enough to allow of two thicknesses being placed; then put the glass aside for twenty-four hours or more in a dry place; the longer they remain up to a certain time the finer the gloss; they are then ready for cutting; in doing which, be sure to cut inside of the gum which is placed on the edge of the glass for holding down the picture. Be sure not to allow the gelatine to get overheated, as this destroys the whole process. Also be sure to slightly warm the glass before placing the picture on it, in order to drive off the dampness. Don't heat too much, as this will injure the collodion film.

"The collodion may be varied according to atmosphere; if a dry atmosphere, use more alcohol and less cotton. The finer the surface of your first backing-board which comes in contact with the picture, the finer the result. The gelatine solution should be strained when first made, then allowed to cool, then re-heated before using. The process of straining or filtering produces small bubbles, which only disappear by cooling the solution. Never strain or filter it unless actually necessary to get out specks or dirt. The small card pictures need only one thickness of cardboard for backing."

SOFTNESS AND INTENSITY.

THE *Western Photographic News* (Chicago) gives the following résumé of the conditions which produce intensity and contrast in negatives:—

"The normal conditions that produce contrast, chemically are, first, an increase of the per cent. of acid in any of the solutions; second, tincture of iodine in the collodion, which may be classed as an acid, as it produces a vigorous acid in the bath; third, short exposure is a well-known method; fourth, certain positions of the model, and directions of the light and camera during exposure; fifth, motion of the plate during development; sixth, short setting of the collodion film; seventh, short immersion of plates in bath; eighth, under certain conditions, strength of the solutions. This has been relied on too much, as it is one of the lesser causes of this effect, and then only conditionally true. Some of the abnormal conditions of excessive contrast are,

first, impure chemicals, and an inharmonious adaptation of the solutions to each other; too new a cadmium collodion; too alkaline a bath, or a nearly neutral one. A neutral bath, if impure, gives great contrast, and hazy or foggy effects; acid here will give softness, if used in proper proportion, and merely to neutralize or slightly acidify. If a slightly acid condition does not remedy the fault, the bath should be purified by neutralizing, and subjected to the permanganate of potash and light treatment, or light simply, as preferred. The causes that operate in an opposite direction, to produce softness, are given inferentially, or suggested, in each case of excessive contrast. I will briefly enumerate a few.

"First—decrease the proportion of acid in one or all of the solutions. Second—Long exposure. Third—Certain positions of the subject, and direction of light upon the same. Fourth—A quiet plate during development. Fifth—A copious use of developer, which produces softness by washing the silver off the plate. Sixth—Long setting of the collodion film, and long immersion in the bath. Seventh—An increase of the per cent. of iron in the developer. Eighth—Alcohol in the developer, which gives softness as well as flowing properties."

"LOOK OUT FOR YOUR EYES."

BY H. BRUYERE.

ATTENTION is again being called to the sanitary condition of the operating room, and, despite the reiterated warnings against the use of cyanide, its convenience, safeness (as regards the stability of negative), and quickness of result, will never banish its employment whilst hypo is the only substitute. Ether and alcohol have both had their share of chemical abuse—no doubt well merited—but the ills springing from focussing by the eyes seem totally to have escaped general criticism. Perhaps the following argument may direct more attention to this neglected portion of human economy.

The easy focus of the eye is from nine to eleven inches, varying according to physique, on the same principle that, although we are all generally formed alike, particularities make one tall, another short; one stout, others slim. This will also apply to the slightly varying focus of the eyes, which, for the sake of distinction, will be called the "normal focus."

If a piece of printed matter be placed at this distance (normal focus) from the eyes, and both eye and hand instinctively hit the distance, the eyes feel easy, unrestrained. Direct the eyes a few yards beyond the normal point, still the sight is easy. Direct the gaze to the distant stars, no unnatural effort seems to arise in their viewing. Try the converse; at the distance of normal sight place the printed matter; then gradually advance it towards the nose: every inch of advance increases the feeling of uncomfortableness, till the nerves are absolutely painful in their tension, and quite a feeling of relief ensues when the sight returns to its normal point. This experiment is adduced to show that nature has given illimitable sight beyond the "normal focus," but the power of seeing within this focus rapidly diminishes.

The photographer is placed in the latter condition who, to distinctly view the camera image, has to place his eyes far within this "normal point," and, by a curious anomaly, has to ignore the laws concerning his own sight to conform to others governing the distinct vision of small bodies. Although the eyes in the end adapt themselves to this new order of vision, still the penalty must be paid in impaired vision, in seeking to force an unnatural power on the eyes, viz., making them a microscope; and the image on the ground glass when focussing a carte portrait may truly come under that denomination.

Two circumstances prevent the immediate perception of this accruing evil. Firstly, during the bloom of early life

the physical power is sufficient to mask the harm, acting in the same manner respecting any other bodily excess. Secondly, the defect, though daily happening, is so incremental as to be unperceivable, and is only felt when declining years, and that peculiar decadence of the eye (*arcus senilis*) weakens its organization, when the deterioration of the eyesight is found to be in greater proportion than years or the change alluded to would warrant.

To avoid this evil, none the less sure though distant, "use a focuser." The usage and adjustment of this well-known instrument would be but a platitude to describe, and the practice of a large and rapid business, extending over a lengthened period, gives an emboldment to the above advice. Without wishing to make an invidious selection, the form of eye-piece manufactured by Solomon, of Red Lion Square, is as good and as economical as any in the market. One thing with all these instruments must be insisted upon: the absolute necessity for a "clamping ring," for without it the constant pressure of the eyebrow will little by little derange the focus, and blame might be attached to the performance of the instrument, due only to the neglected precautionary measures of the operator.

FRENCH CORRESPONDENCE.

AIME GIRARD'S MICROSCOPIC INVESTIGATION OF PAPER FIBRES—BORIC ACID IN THE DIPPING BATH—TONING WITH ACETATE OF LEAD—THE FRENCH TRANSIT OF VENUS OBSERVERS—PHOTOGRAPHIC EXHIBITIONS.

MONSIEUR AIME GIRARD has just communicated to the Academy of Sciences the results of some interesting investigations which will be of some importance to photographers. For more than twenty-five years complaints have been made, and not without cause, against many paper manufacturers, concerning the material produced at their factories, the quality of paper made by the best firms being sometimes called into question. The reasons of these complaints have been searched for far and wide, and all kinds of means have been resorted to to secure an improved product by modifying the raw material employed in the process of manufacture. M. Aimé Girard has now taken up the question from a new point of view, making a microscopic study of the vegetable fibre of which the pulp consists, and in this way he has been enabled to determine the precise conditions which a vegetable fibre should fulfil in order to produce a paper of first-class quality. The fibre must be long and thin, and should be capable of being doubled back upon itself with ease, so that the paper may acquire solidity in the process of felting. The tenacity of the fibre, upon which it is usual to lay such great stress, is only of secondary importance, it appears, for when a sheet of paper is torn, the fibres scarcely ever break, but escape intact, gliding between one another. The result of his experiments has led M. Girard to divide into five classes the different materials which serve for the fabrication of paper, and these he thus defines:—1. Round and nervous fibres. In this class there is to be found the fibres of flax and hemp only. 2. Round and smooth fibres slightly nervous, such as the esparto grass, jute, phormium, hop, and sugar cane. 3. Fibro-cellulose matter. In this class there is only one material to be found: the pulp produced from wheat and rye straw. 4. Flat fibres, like those of cotton, or such as are extracted from the wood of the mulberry tree and bamboo by chemical means. 5. Imperfect raw material. This is obtained from wood by mechanical means, and does not consist of fibrous matter at all, but of bundles of fibres adhering one to the other without any elasticity or any faculty of being bent. Such material as this introduced into pulp can only serve to produce a very imperfect paper. In the course of his investigation M. Girard was not content to examine the different fibres under the microscope of which he speaks, but he photographed them and prepared enlarged pictures from the clichés, so as to be able to study their form more deeply, and to classify the types.

At the last meeting of the French Photographic Society M. Fleury Hermagis alluded to the employment of boric acid for acidulating negative baths. No handbook of photography has yet advocated the employment of this acid for the purpose indicated; nevertheless, according to our skilful optician, it may be so employed with advantage, always keeping the bath slightly acid with it. "It is a known fact," says M. Hermagis, "that with a bath acidified by means of nitric acid the best collodion is exposed to partial lifting of the film, and the latter, moreover, loses some of its sensitiveness. It is well known, also, that acetic acid, less energetic in its action, evaporates very fast, so that fogging and other defects, which are dissipated by its presence, reappear again just at the most inopportune moment. Boric acid has the triple advantage of acidulating at once, of not occasioning any lifting of the film, and of preserving the sensitiveness of the iodobromide of silver in the same degree as if the dipping bath was in a neutral condition. The operator commences by putting his bath into a neutral state by the use of a concentrated aqueous solution of bicarbonate of soda. A few drops added to every hundred grammes of bath will suffice. As soon as a trace of turbidity is apparent, enough soda has been added. The bath is then filtered, and acidulated with about two or three grammes of boric acid for every litre of solution. A white collodion will work very well under these conditions." M. Hermagis states that with a bath of this kind the time of exposure may be reduced by one-sixth. It is essential that the boric acid should only be added to a new bath, for old baths do not answer with this treatment. It is necessary also to take great care not to change the iodiser in the collodion, but to have a special bath for every different kind of collodion. M. Fleury Hermagis adds that you may succeed sometimes without fulfilling these conditions, but they are, nevertheless, necessary for operating smoothly and uniformly.

A very skilful provincial photographer has addressed to me some interesting observations upon the employment of a fixing agent containing acetate of lead. The process, which was published in England twelve or thirteen years ago, is scarcely ever employed in this country, although it would be well, perhaps, to make use of it. The correspondent of whom I speak has still in his possession prints which were produced a dozen years ago, and were secured in this way. Despite their age, they have preserved all their brilliancy in the whites, and this freshness they possessed from the first, while other pictures, produced on the same date, toned and fixed in the ordinary manner, have faded very perceptibly. M. Aleide, my correspondent, deduces from this that acetate of lead, far from injuring the prints, as has been stated, actually preserves them. A picture may remain more than thirty minutes in a bath of hyposulphite of soda containing acetate of lead and ten per cent. of bicarbonate of soda, without the whites being in any way altered. The old prints of which he speaks were only passed into an old acetate of soda gold bath, which had been exhausted, and then, without being washed, put into the hyposulphite solution, prepared as we have said. They were left here for a period of thirty minutes, until they had assumed a beautiful violet tone, which they still preserve. The whites have remained quite pure, and the albumenized paper retains to this day all its brilliancy. In this process the washing requires much more care, and it is necessary that the water should be renewed from time to time. If a print is not rapidly washed, it assumes a yellowish tone on drying.

Last Monday M. Mouchez, one of the French savans who were instructed by the French Academy to observe the Transit of Venus, gave a personal account before the members of the difficulties he encountered, and of the dangers he had to undergo, before he attained the success that fell to his lot. He had passed three months on St. Paul's Island, and I need not say that he had a most enthusiastic reception by the Academy. M. Mouchez has

described in detail all the work that his companions and himself accomplished during the duration of the transit. By a circumstance as happy as it was unexpected, the weather, which had not ceased to be very unfavourable, cleared up suddenly at the right moment, and during the whole time of the transit it was possible to secure photographic images of the phenomenon. As many as four hundred and forty-three Daguerreotype plates were secured, and one hundred and forty-two collodion clichés, from which, however, must be deducted sixty-seven Daguerreotypes and twenty-nine collodion negatives which were unsuccessful. There remain also four hundred and eighty-nine good results, which may be employed for making micrometric measurements, which will be at once conducted under the personal superintendence of M. Fizeau. When we take into consideration these prodigious results, we cannot but congratulate ourselves on the marvellous progress that has been made in photography during the last few years.

At the *Palais des Champs Elysees* they are organizing at the present moment an International Exhibition of industrial products for exportation, and a place will be reserved for photographs and photographic apparatus. An old photographer, M. Moulin, has charge of this portion of the exhibition, and he has just addressed to his colleagues an appeal for contributions. Another exhibition, of a purely photographic nature, is also about to be organised at Brussels, as your readers have no doubt been informed, and it is in this direction that the attention of our artists is turned for the present. The Parisian photographers will, most probably, avail themselves in good numbers of the hospitality of the Belgian Photographic Association. It is very desirable that our English colleagues should also take part in this exhibition, so that the assembly may gain in interest and importance.

ERNEST LACAN.

PHOTOGRAPHIC OPERATIONS IN EGYPT IN CONNECTION WITH THE LATE TRANSIT OF VENUS.

BY CAPTAIN ABNET.*

I HAVE been asked to give an account of my photographic operations during my late visit to Egypt in connection with the transit of Venus. This I am happy to do. I should like to add, in some degree, to the interest of that remarkable country—remarkable for its climate, its river, its ruins, and its history. Where my chief work lay was at Thebes, distant nearly 500 miles to the south of Cairo; and it was a matter of no small anxiety to me how I should transport all my instruments and observatory to that spot. The boats, or “dahabeahs” as they are called, would hardly have taken all unless I had engaged one which was out of all proportion to the passenger accommodation which I required. My party consisted of myself and three Sappers, whose names I should like to record, as owing to them, in a great measure, resulted the success of my work. They were Sapper Laffeaty, chief photographer, and Corporal Milne and Sapper Farr as assistants. I may here say that the hearty goodwill with which they worked and carried out instructions, sometimes preparing plates to the small hours of the morning, is beyond all praise. I may truly say that all failures (for failures at first there were) were taken to heart by them, equally as much as by myself; and had it not been for the *entente cordiale* that existed between us all, the photographs we brought home might not have been so good even as they are. Honestly, I never knew so thoroughly before what a godsend it is to have soldiers who know you to work with you. I am prouder than ever I was in belonging to a corps that can produce such true men. Well, owing to the kindness of the Khedive, I was (with Colonel Campbell, an amateur, who was going to make eye-observations of the transit) towed up the river by a government tug, on which I

placed my hut. The instruments I took on board my boat, stowing them, as you may imagine, with most jealous care; for I was going to a place where it was hard to purchase even a nail; all great repairs would have been hopeless.

We started on the 25th October from Cairo, our baggage (which had occupied three large trucks on the railway) distributed as I have indicated. On the 7th November we sighted Karnak just at sunset; and a glorious vision it was. The old ruins seemed like rubies set in the dark green of the palms which rose between us and them. I certainly have never been so impressed by any sight excepting, perhaps, by the first view of the Alps from the Jura, when there was no rail to Geneva, and where one had to go by diligence from Dole. It is really beyond word-painting, and certainly beyond the palette. The scene was soon over as the sun set, and we were nearly in darkness by the time we arrived at Luxor. The next morning we moored up against an island just above Luxor, and the same day began erecting our observatory. This wooden observatory is one which is well worthy of a study; it is so complete in itself. Each part was accurately fitted, and there was no driving of nails to put it together. Each piece was numbered, and had its own screws and bolts. The roof of the hut all took down, being heptagonal, each shutter forming part of it could be removed separately according to the position of the sun. One fact worthy of record is this, that it is watertight, a quality usually absent from such erections. I had it nearly a year at Chatham before I took it to Egypt, and, to my knowledge, not a drop of rain entered it when the shutters were up. After using it so long at Chatham, the feeling of knowing every nook and corner in it was one of intense comfort. The only point in it which would have borne improvement was the dark room, which, for a hot climate, was just a little bit too small, being 8 feet by 4 or thereabouts. The internal arrangements were admirable for wet plates, and the additions I made for dry plates answered very well.

I will first give a sketch of the drying cupboard, certain improvements in it having been suggested by Corporal Sharpe, R.E. It was a box attached to the side of the wall of the dark room away from the developing-sink. It was divided into two portions in its length, and each length had a separate flapdoor opening upwards, with a lock and key. In each compartment were two shelves, so that it would contain two rows of plates.

The plane of the plates as they stood up to dry was at right angles to the front of the box. The top corner was held by a triangular notch cut in a bar of wood, traversing the box from back to front. (There was therefore as many bars as the number of plates that the cupboard could hold.) The bottom corner for draining was held by a porcelain inkpot. The plates when drying were about two and a-half inches apart; and by this means about six dozen plates would be prepared at one working. The size of the plates was 6 by 6 patent plates, slightly ground at the edges.

It was a week before we set regularly to work; there was so much preparation in adjusting the instrument and getting chemicals, and so on, in order. I think it was on the 15th that we took our first sun-picture. We lived on board our boat, our Syrian dragoman Milhelm Ouardy (a capital man, by-the-by, and fully up to his work) catering for us. Mutton, chickens, and pigeons were our principal meat, turkeys and ducks being occasionally added as opportunity offered. We took our own liquor with us, a supply of Tennant's beer being laid in for the albumen-beer process. Though not strictly photographic, I will record our times of eating—coffee and eggs at eight, breakfast (really a lunch) at twelve, and dinner at six. We always got up before the sun, which was generally about six o'clock, and went to bed when our work permitted. Up the Nile one does not require so much sleep as at home, the air is so exhilarating.

* Read before the Photographic Society of Great Britain.

We had taken out some ten dozen dry plates for solar work, which we had prepared at home, and began exposing them. At first they not seem to work quite satisfactorily through causes which were overcome; but on the day of the transit we much regretted that we had not more of them. Preparing plates at first was easy work enough, as the temperature was equable, never getting cold at night, and, in consequence, we used our Chatham plates too freely, thinking everything would be plain sailing. Alas! the weather changed; the first stone of the season was thrown from heaven (each stone up to the third, according to Mahomedan traditions, increasing the cold), and then everything went wrong. Our baths, which suited daywork, were too weak for the cold of the night, and it was too hot to prepare the plates during the day. Again, the dust interfered, and we were obliged to wait for the dew to lay it before we dared venture on preparing a large batch. We had trial after trial. As fast as one difficulty vanished another made its appearance; and not too long before the transit things looked almost hopeless. Our "stand-bys," the Chatham plates, were at a low ebb, and we had to prepare at least five dozen others before the day. Eventually, however, all difficulties were overcome, and on the day we were ready. It should be mentioned that the difficulties in preparing the same dry plates for ordinary work did not arise; it was owing to the necessity of keeping up great sensitiveness and cleanliness that caused them in great part. I annex a paper* showing the preparation of the plates and their mode of development. I may mention one fact, viz., that dissolved dried albumen was used instead of white of eggs. It was necessary to find some substitute for eggs in localities where it would be hard to obtain them. Whenever albumen is to be used, I use that preparation of it. It is cheap, convenient in form, and (from one maker) perfectly soluble in water. I strongly advise all who work with albumen to give it a trial. I may also mention, in connection with the annexed paper, that the developing solutions differ from those I originally published for the albumen-beer process in the *Monthly Journal of the Corps of Royal Engineers*, in November, 1873, as also in the *YEAR-BOOK OF PHOTOGRAPHY* for 1874. Owing to Colonel Wortley's introduction of the strong alkaline developer, I increased the ammonia to what I gave, at the same time increasing the strength of the pyrogallie acid considerably. I omitted the bromide for reasons I gave when I first published the process. I have to thank that gentleman for the kind interest he has taken in all matters relating to the photography connected with the transit of Venus.

(To be continued.)

DRY-PLATE-PROCESS FOR SOLAR PHOTOGRAPHY.

BY CAPT. W. DE. W. ABNEY, R.E., F.O.S.†

BEFORE commencing the preparation of the plates, some fresh eggs (say four for a dozen medium-sized plates) are procured, and the whites carefully beaten up (with one drachm of liquid ammonia to each white) by a whisk, a bundle of quill pens, or by shaking in a bottle into which fragments of glass have been introduced. When the froth has subsided, the clear fluid is procured by filtering through muslin, and is placed in a bottle labelled A. A glass of bitter or mild ale is next obtained, and to half of it (which should be 5 ounces) 10 grains of pyrogallie acid are added, and the solution, if necessary, is filtered through filter-paper. This is lettered P. The other 5 ounces of beer are placed in another bottle, and labelled B.

Should the fresh eggs not be obtainable, dried albumen may be used; 20 to 25 grains of the latter should be dissolved in an ounce of distilled water, and substituted for them.

Bottled beer may also be substituted for the ordinary

bitter ale. Care should be taken that, by a gentle heat, the carbonic acid is all liberated, otherwise carbonate of ammonia will be formed on the addition of alkaline albumen.

(i.) Any ordinary collodion will answer. The bromo-iodized sample supplied by Thomas of Pall Mall, with 2 grains of pyroxyline added to each ounce, gives very rapid results. For sun-pictures, however, a modification is advisable; and much will depend on the climate in which it has to be employed.

(ii.) For a cold climate, collodion made by the following formula will be found to give good results:—

Thomas's bromized collodion	...	20 ounces
" ordinary bromo-iodized	...	20 "
Plain collodion, not iodized	...	6 "
Pyroxyline	...	276 grains
Water	...	400 minims

(iii.) For warmer climates the following will be found to answer better:—

Thomas's bromized collodion	...	20 ounces
" bromo-iodized	...	20 "
*Alcohol, sp. gr. .805	...	6 to 8 "
Pyroxyline	...	300 grains
Water	...	120 minims

With (i.) the ordinary nitrate of silver bath, 40 grains to the ounce, is used. If greater sensitiveness is required, 10 grains of nitrate of uranium to each fluid ounce of the above are added.

With (ii.) and (iii.) the above bath should be used, together with another made 60 grains to the ounce of water.

A substratum to the collodion is recommended, to insure adhesion of the film to the glass plate during development. This is made by mixing the white of one egg with 40 ounces distilled water, and applying it to the surface of the plate by a piece of swan's down, calico, or flannel folded over the edge of a strip of glass and used as a brush. The brush is dipped in the fluid, and drawn down the plate in parallel lines till the whole surface has received a coating. Here I may mention that a clean plate is necessary; but much polishing with a silk handkerchief or chamois leather prevents the substratum taking kindly to the glass.

Another substratum, which seems to give almost better results than the albumen, may be substituted for the above:—

Sheet gelatine	...	75 grains
Distilled water	...	60 ounces
Ammonia	...	1 ounce
Alcohol	...	1 "

The gelatine should be softened in 30 ounces of cold water, and then dissolved by 30 ounces of boiling water. When cold, the remaining ingredients should be added.

If a plate (after the substratum has been thoroughly dried) is coated with collodion (i.), it is sensitized in the ordinary manner in the 40-grain bath, i.e., for about four minutes in cold, to 2½ in warm weather. If the plate has been coated with (ii.) or (iii.), it is plunged in the 40-grain bath, and kept there till all "greasiness" has disappeared. It is then transferred to the 60-grain bath and kept there for seven or eight minutes longer, i.e., until a creamy film is obtained. The plate is next plunged into distilled water, or spring water which has been rendered slightly alkaline by adding a few drops of ammonia to it (if iron be present as an impurity), and to which, after boiling and filtering, a few drops of nitric acid have been added to restore neutrality. When the "greasiness" has disappeared from the film, the plate may be washed under the tap for a minute, or in different dishes of water, until all free nitrate of silver is got rid of. (This may be effected rapidly by adding a pinch or two of common salt to the last washing water but one in the dishes.) In a small tumbler are next mixed equal quantities of A and B, stirred up with a glass rod, and floated over the washed film. If

* Drawn up by request of Sir G. Airy in March, 1874, for the transit observers.

† Communicated to the Photographic Society of Great Britain.

* The hotter the climate, the more alcohol will be required.

all the nitrate has not been washed away, stains may here become manifest. This solution is kept on half a minute, and is then poured off. The plate is once more thoroughly washed, and solution P is floated over for another half minute. The plate is then set up on one corner to dry spontaneously. Before being stored away, the last trace of moisture may be expelled by gently warming over a stove or Bunsen burner. In dry climates this precaution need not be taken. As a rule, the plate requires "no backing" to prevent blurring of the image; but if it appears very transparent a backing may be necessary. Cartridge paper stained with any red dye (alkaline aurine will answer), and coated with gum and flour stained of the same colour, will give what is required. When damped, the paper will adhere to the back of the plate, and dry in optical contact with it. It can easily be removed by wetting.

The exposure is the same as that necessary for a wet plate prepared with the same collodion, though no damage will be done to the picture if six times that amount be given. With the uranium bath the dry plate is quicker than a wet plate.

The development need not take place for a month after exposure. The following solutions must be made up:—

No. I.	{ Pyrogallic acid	12 grains
	{ Water	1 ounce
No. II.	{ Liquor ammonia	1 part
	{ Water	4 parts
No. III.	{ Citric acid	60 grains
	{ Glacial acetic acid	30 minims
	{ Water	1 ounce
No. IV.	{ Nitrate of silver	20 grains
	{ Water	1 ounce.

The plate is washed in spring or rain water of a not less temperature than 60° F. till all the beer has been removed. Sufficient of No. 1 is taken to well cover the plate, and first flowed over it. Into the developing-cup are then dropped three drops of No. II., and No. I. is poured off the plate on to it. The solution is then flowed over the plate again, and after a few seconds the detail will begin to appear by *reflected* light. As detail appears, another two drops of No. II may be added, and so on till nearly all the detail is visible. The plate is now washed in water of the same temperature. Here it may be remarked that stronger doses of No. II. may be used to underexposed pictures. Six drops of No. III. are next dropped into a clean developing cup, and the same quantity of No. I. added as before. This is flowed over the plate to neutralize any trace of ammonia remaining. Into the cup are now dropped two drops of No. IV., the pyro. solution from the plate poured on to it, and once more applied to the film. The image will gradually acquire strength, the remaining detail appearing. The intensity is gained by adding to the same or fresh (acid) pyro. solution more silver (No. IV.). When the image appears of sufficient density, it is fixed with a solution of hyposulphite of soda or cyanide of potassium. In the case where the plate is backed, the film should be wetted first, and then the paper removed.

The alkaline development produces a faint image by the reduction of the organic salt and bromide of silver to the suboxide of silver. The iodide is unattacked by it. The acid silver development utilizes the exposed iodide thus: the attraction of the suboxide for fresh silver (deposited by the acid development) is increased by the irritated iodide, and thus density is acquired.

It will be noticed that no restrainer, such as bromide of potassium, is used with the alkaline development. The albumen dissolved by the ammonia plays the part of a retarder, but not of a destroyer. Thus the image is well under control.

An underexposed picture has an image of slate-colour; an overexposed picture has one of an olive-green; whilst one properly exposed is of a rich chocolate-brown. Every plate sufficiently exposed will yield a good negative.

Correspondence.

ELECTRO-PLATING BRASS WORK.

DEAR SIR,—Every photographer must have had reason to deplore the destructive effect upon his camera of the solutions he uses: hinges drop to pieces, corners open (in the dark slide especially), and our friend the light, who, like fire, is a very bad master, becomes matter in the wrong place. Brass binding mitigates the evil, but does not cure it, for the composite metal becomes soon more or less reduced to nitrates, screws get loose, and their heads come off.

As it does not yet appear to have been tried, I venture to suggest the simple plan of electro-plating the brass work with nickel; the process costs only about one-fourth the price of silver plating. The nickel coating will resist entirely the oxidising influence of the atmosphere and sulphuretted hydrogen, and is comparatively but slightly affected by nitric acid, and not at all by any other acid likely to be employed.—Yours respectfully, P. ROLLS.

PROTECTING CAMERA SLIDES, ETC.

SIR,—Having used the varnish mentioned at foot in our picture framing department for Oxford and other wood frames for several years, I yesterday applied it to an old camera and slide which has laid by during the winter, and consequently looked decidedly seedy. The result is a presentable article, and an inward vow not to order a new camera just yet. Varnish for wood work dries in the sun or warm room, being careful not to place the article varnished near a fire, as it will blister.

Orange shellac	2 ounces
Sandarac	1 ounce
Benzoin	1/2 "
Rosin	1/2 "
Methylated spirits of wine	1 pint.

Place in a warm place, and shake. ARCHER CLARKE.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE Edinburgh Photographic Society gave another of its "Popular Evenings" in the Queen Street Hall, on Wednesday, the 17th inst., when, as usual, every available seat was occupied. The exhibition was entitled "Sketches of English Life and Scenery," and included pictures of several of the principal buildings in London, the gardens and conservatory of the Horticultural Society, the Zoological Gardens and many of their tenants, and a large number of *genre* pictures illustrating various phases of English life, both grave and gay.

Dr. JOHN NICOL, who occupied the platform, commenced by saying: "Those of you who have been in the habit of attending the popular meetings are aware that the committee who are charged with the arrangements have always tried to secure for each exhibition a series of connected pictures which should form a basis on which to build a story and description of a tour, &c. In this way we have together, during the last dozen years, visited various parts of the world, including most of the grand scenery of our own land, generally with much pleasure, and sometimes, I hope, with profit also. To this rule, however, there has been one exception, when the experiment of a series of unconnected pictures was tried, being selections from the works of the best photographers throughout the country. The experiment was so successful that the committee resolved to risk another attempt in a somewhat similar direction. The exhibition of to-night, however, differs from that of the experiment alluded to, in so far that, while it consisted of landscape and architecture, this is altogether, or almost altogether, of figure subjects. I say almost altogether, as I confess that at the eleventh hour I began to have some misgivings as to the result, and applied for a few pictures of a somewhat different kind. What I wish you to understand is simply this: that the pictures for the exhibition of to-night are of such a nature that each will speak for itself, and tell its own story—in fact, better than I can do—and that therefore I shall have little more to do than merely mention the titles, most of which you will find exceedingly appropriate, although you will please to remember that I have neither the responsibility nor the credit

of them, as I shall simply quote from the printed list. Before the room is darkened, I wish to take the opportunity of saying that the members of the Society—and I may say, also, the friends who have honoured us with their presence—are much indebted to Mr. York, of Notting Hill, London, who, in the most liberal manner, placed the whole of his fine collection of lantern pictures at our disposal. The transparencies are all produced by himself, and the figure subjects from negatives by Mr. Gillo, of Bridgewater. Some of my hearers know a little of the difficulties encountered in photographing babies, and will be able to form some idea of what Mr. York had to contend with in getting the negatives of the inhabitants of the Zoological Gardens, and they will, I am certain, when they see the results, agree with me in saying that he has succeeded beyond what could have been thought possible. The pictures by Mr. Gillo prove him to be an artist of no mean ability, and a photographer of great technical skill, and at the same time give abundant evidence that in skilful hands photography can be readily raised to the dignity of high or fine art."

The pictures were then projected on the screen, and formed a most delightful exhibition, which, with the running commentary of the lecturer, kept the audience in a continuous state of laughter during its whole course.

Talk in the Studio.

OBSCENE PHOTOGRAPHS.—At the Middlesex Sessions, before Mr. Edlip, Q.C., Assistant-Judge, Charles Ulfert, 34, hawker, pleaded guilty to selling a large quantity of obscene photographs. Mr. Cooper prosecuted on behalf of the Treasury, and Mr. F. H. Lewis appeared for the prisoner.—Mr. Cooper said that this was the first occasion on which the Government had taken up the prosecution of such a case as this. It had been ascertained, from a letter found at the prisoner's premises, that he had been carrying on the business since November, 1872.—Mr. F. H. Lewis said that a short time since proceedings had been taken at the Mansion House against the prisoner for selling pirated photographs of engravings published by Messrs. Graves, and, on the officers going to the premises, they found the obscene photographs. He denied that the prisoner had been carrying on the business for so long a period as that mentioned by the prosecution.—The Assistant-Judge passed sentence of twelve months' imprisonment with hard labour.

MORE OBSCENE PHOTOGRAPHS.—At the same sessions William Oliver, 28, picture frame maker, pleaded guilty to unlawfully publishing and selling indecent prints. Mr. Besley said that in 1873 there was gradually springing up in London a sale of photographs which were of an obscene character that the Society for the Suppression of Vice felt compelled to take proceedings against several persons, amongst them being the prisoner, who kept a shop at No. 1, Wych Street, Strand. He was committed to this court for trial at the October sessions in 1873, but was admitted to bail, and on being called on to surrender did not appear, consequently his recognisances were forfeited. A warrant was issued for his apprehension, but he escaped to America, where he remained for some time, and since his return to this country he had been earning an honest livelihood at his own trade. As the prisoner had expressed his determination not to enter again into the filthy traffic, he asked the court to distinguish between this case and those which ordinarily came before it.—Mr. Baker, on behalf of the prisoner, urged that he had a wife and family entirely dependent upon him, and asked that the court would allow the person who had been bail for him on the previous occasion to enter into recognisances in double the amount to bring him up for judgment when called on.—Sentence was postponed.

ANOTHER MODE OF MAKING PAPER TRANSPARENT.—Our readers will remember that some time ago the late Mr. Blair described the use of turpentine for making paper temporarily transparent. Herr Fuschner proceeds as follows to gain a similar result:—One volume of castor-oil is dissolved in two or three volumes of spirits of wine; it renders paper transparent, and the spirit rapidly evaporating, the paper in a few minutes becomes fit for use. A drawing in pencil or in Indian ink can thus be made, and if the paper is placed in spirits of wine, the oil is dissolved out, restoring paper to original condition.

To Correspondents.

R. M. SMITH.—The lens to which you refer may be used for portraiture in a very good light; but it is, of course, much less rapid than a portrait lens.

T. ARNOLD DE RIVIERE.—Acetate of iron, or acetate of iron in conjunction with sulphate of iron, used as a developer for negative, gives greater intensity and a somewhat more non-actinic colour than sulphate of iron alone. There are various modes of preparing the acetate, in each of which it is desirable that the solution should be used fresh, as it deteriorates by long keeping. Dissolve twelve grains of protosulphate of iron in half an ounce of water, and twelve grains of acetate of lead in half an ounce of water; mix the two solutions, and filter out the white precipitate of sulphate of lead; then add ten minims of acetic acid, and the solution is fit for use. Or dissolve twelve grains of protosulphate of iron and six grains of acetate of soda, and add twelve minims of acetic acid. Or, to a twenty-grain solution of protosulphate of iron add twenty minims of acetic acid and two or three drops of liquid ammonia, when a portion of the sulphate will be converted into acetate of iron. Alcohol may be added in any case to aid the flowing freely of the solution, at the pleasure of the operator; but, of course, the alcohol only possesses this mechanical value. We very rarely use alcohol at all in a developer.

R. W. H.—The addition of excess of nitric acid will sometimes cause fog, but it is probable that the water employed in making the bath has not been quite pure, but had contained organic matter, in which case a thorough sunning—or, failing that, boiling—will probably be the best remedy; or you may test it with a solution of permanganate of potash. Take a ten-grain solution and add a very few drops to the bath. If the pink colour first communicated quickly disappears, organic matter is present. Then add a few drops more, shaking each time, and allowing an interval of (say) ten minutes betwixt each addition. When a faint pink or purple tint remains, all the organic matter is removed, and you may filter, and try a plate.

LUNAR.—Your enquiry as to where information on "night photography, such as pictures of the moon, &c.," may be found, is somewhat indefinite. Do you mean by this astronomical photography in which a telescope is used, or simply how small images of the moon may be obtained in the ordinary camera? We have published many papers on astronomical photography. In our fifth volume, pp. 17 and 31, you will find much interesting information on lunar photography. But if you refer simply to camera pictures of the moon, we do not remember, at this moment, that anything has been published, except incidentally. There is not, in fact, much to say on the subject. A bright, clear night, with the moon shining brightly, and the ordinary wet process, will enable you to secure a good negative of the moon almost instantaneously. If the night is not sufficiently clear, or the chemicals are not in sufficiently good order to secure an instantaneous picture, the image of the moon will, of course, be blurred from its movement, unless, by some contrivance, you make the camera move more gently and regularly, following the movement of the moon.

E. H. (No. 1).—The precipitate was doubtless a mixture of the carbonates of silver and uranium. On neutralizing a bath with carbonate of soda it is useless to test it with litmus paper until it has stood some time, inasmuch as the carbonic acid liberated by the decomposition of the carbonate of soda will produce an acid reaction. It is probable that you have precipitated a great part of the silver by the continued additions of carbonate of soda, and so weakened the bath very much; but the simplest mode of testing the solution now is to try a plate.

B. M. F.—If your pyroxyline tends to give a somewhat thick, glutinous collodion with a tough film, the iodide and bromide of cadmium will increase that tendency, whilst the use of ammonium salts will reduce the tendency. With the latter, the collodion will more quickly ripen, and as it ripens the collodion will become less glutinous, and the film less tough and horny. 2. The addition of a few drops of tincture of iodine to a new, colourless collodion will often enable it to be worked without fog. 3. We, as a rule, prefer equal parts of ether and alcohol. In our own practice we have found no disadvantage arise from the use of methylated ether and alcohol. 4. Methyl alcohol and methylated alcohol are totally different things. The former is wood spirit, the latter is ordinary alcohol to which ten per cent. of methyl alcohol has been added, with which addition—which spoils it for drinking purposes, without injuring it for most manufacturing purposes—it is permitted to be sold without payment of duty. Methylated ether is ether manufactured from methylated spirits.

L. D.—The refusal of your gold bath to tone, and the dirty brown colour it has assumed, are suggestive of decomposition caused by touching it with fingers which have been immersed in the fixing, or in contact with hypo in some form. The print enclosed is stained with hypo at the back; it suggests having been washed before toning in a dish which has probably been used for washing prints after toning, and has, therefore, traces of hypo about it. Are you careful to keep each dish to its own use? An unfixed print should never be placed in a dish which has had the slightest contact with hypo or been used for toning purposes.

ARCHER CLARKE.—Thanks.

MR. HOWARTH's address should be 111, Thornton Road, Bradford, not 3, Thornton Road.

G. DE VILDER.—Thanks; in our next. Several Correspondents in our next.

The Photographic News, April 2, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PROGRESS IN PHOTO-ENAMELLING—HONOURS TO PHOTOGRAPHERS IN BERLIN.

Progress in Photo-Enamelling.—Like his brother the late Prince Consort, the Duke of Saxe Coburg Gotha takes a lively interest in art matters, and we see that very recently he has paid some attention to that beautiful branch of our art, enamel photography. There cannot be a doubt that these charming pictures will take the highest place in photographic portraiture, and one may safely rely upon good enamels never becoming very common. The Duke of Saxe Coburg, it appears, has been struck with some fine productions of this kind produced by a German artist, M. Stender, of Hanover, and in order to encourage further work in this direction, and to promote the production of imperishable photographs in this charming form, his Highness has conferred the Gotha medal for art and science upon M. Stender. We are glad of this for two reasons: it shows how highly the art-science is esteemed by one of the best authorities on such matters in Europe, and it will moreover serve as a great incentive to others to perfect the process as much as possible. Fortunately for the better class of photographers, the preparation of photo-enamels can never be practised except by those who systematically work up the subject, and possess considerable experience and taste. We shall never see photo-enamels selling at five shillings a dozen, neither is it likely that ill-executed portraits of this kind will find purchasers at all. Only if an enamel is really first-rate will it sell at a sufficiently high rate to recompense one for its production. It is only those who have tried the experiment know how difficult the production of perfect enamels is. At Limoges, whose enamels were famous centuries ago, the art has been completely lost, and one of the professors at the Polytechnic School of that town has recently been endeavouring to revive the pursuit among the townsmen, employing photography, however, instead of painting, as in days gone by. There seems, however, to be no information extant, either of a written or printed character, for the old Limoges enamellers seem to have passed their knowledge of the art on from one generation to another without committing any of their experiences to paper. So the learned professor finds that if he desires to revive the name of Limoges enamels, the only way is to begin from the beginning as all photographers have been compelled to, and work step by step through the delicate process. Many have inveighed against the art because there is always a lack of certainty in its results; but this uncertainty is not only inherent to photo-enamels, but has existed ever since the commencement of the art of enamelling, and constitutes, indeed, one of the main reasons why enamels of all kinds are so rare and sought after. The delicacy of the burning-in operations, and the chances of success that attend them, are phases in the preparation of these charming productions which cannot be regarded altogether as drawbacks. In the same way as in the olden time the casting of a bell was always attended with doubt and difficulty, so well portrayed in Schiller's well known *Lay of the Bell*, so photographic enamels can never be predicted as safely finished until they have gone through the very last operation. But then there is all the more cause for congratulation when the risky business is over, and all one's cares and troubles are ended; the fruits of one's labours and the result of several trials being centred in the shining enamel before us. Every operation has been carefully watched and cautiously conducted, and three times, probably, have you committed the delicate picture to the tender mercies of a fiery furnace; for it is only after the image has been fluxed and cooled that the work can be said to be finished. How eagerly you watch that last operation of all! A soft but vigorous portrait has been produced so far upon

the white tablet; you pour upon it the flux, and proceed to burn-in for the last time. The tablet is put upon a bit of clay near the glowing furnace to warm, then turned round to be heated throughout; then the image is approached nearer and nearer until you consider it may be safely introduced into the entrance of the furnace. As it is pushed farther and farther into the interior, the portrait gradually disappears from view, and nothing is seen for some time, beyond a dull reddish surface; presently the picture begins again to reappear, this time covered with a vivid gloss, which, acting like a transparent varnish, adds redundant brilliancy to the picture. Gradually the tablet is withdrawn, gently it is allowed to cool beside the furnace, and in another five minutes you may rejoice in the success of your work and the end of your labours.

Honours to Photographers in Berlin.—Referring to honours conferred upon photographers abroad, it is satisfactory to find the same falling upon worthy heads. In Germany we find it rare for any photographers to make their mark in one of the bigger cities without some recognition from royalty, and such men as Fritz Luckhardt, of Vienna, and Albert, of Munich, do not remain long unrecognised. Either a medal is given in cases of this kind, or the title of Court Photographer, which is a name of some distinction, and very well worth having, under imperial rule. We notice that the well known portraitists, Messrs. Loescher and Petsch, of Berlin, whose works are widely known throughout Europe, have had the rank conferred upon them by the Emperor of Germany in the same way as the gentlemen previously mentioned enjoy the title from the Emperor of Austria and King of Bavaria respectively. Another firm, M. W. Fechner, also a Berlin photographer, has, it appears, also been the recipient of honours lately, but in this case they came from the Emperor of Japan, who forwarded a costly pair of Japanese vases as a present to M. Fechner, in return for an album containing portraits of a party of Japanese youths who are now studying in Berlin. What, however, we were most glad to hear, in the shape of honours from Germany, was the news recently published of our friend Dr. Vogel, of Berlin, being given a chair at the Industrial College of Berlin, where he has been for a long time lecturer and instructor in photography. On his return from India, where he has gone at the invitation of the Royal Society of Great Britain, in company with Mr. Schuster and M. Jansen, to watch the approaching eclipse of the sun, his services will doubtless not be forgotten, either in this country or his own.

DULL DAYS.*

FOR many years past we have not had such a dull winter as the present one. Since the end of November, 1874, we have lived in a state of sun-eclipse. Sometimes, on rare occasions, the solar orb has shown itself for a couple of hours in the forenoon, but it soon crept back again behind the clouds, and hid itself more obscurely than ever; so that by the time you had sensitized a batch of paper ready for printing, your chance was gone, and the sensitized material became yellow and useless by keeping. Many a day there was scarcely a print per negative to be had, and this, too, about Christmas, or New Year, when one always finds a little ready money very handy. But nothing could be done. It was all very well to say, "Never mind, as January runs on we shall get brighter weather," but it never came. You might watch the barometer and thermometer as much as you liked, and deduce the most favourable results from the data they furnished, but, for all that, the weather remained dull, grey, and wretched.

That no work could be done for Christmas customers is not to be wondered at. With a shake of the head, I inspect my December pictures; they are all a bit under-exposed, notwithstanding the flood of twilight which I

had to use, and which made my models appear hollow-eyed; all seem to regard me with a sinister expression, as if it were my fault they are so unhappily depicted. But what could I do? I can draw back my blinds, but I cannot draw back the clouds at the same time; lines long enough to reach up there have still to be discovered. The only consolation you have is, that all of us are in the same boat, whether we are court photographers or not.

It is very obvious that one cannot undertake any fancy lighting of the sitter in such dull weather. To attempt to secure Rembrandt or any other effects would be madness, although one gets visits from ladies every now and then who desire to be depicted in that style and no other. You may draw back your blinds to their utmost extent, and light up farther with mirrors and reflectors, but such negatives, when developed, always turn out grey and extremely thin, so as to require very much intensifying before being fit for use. Brilliancy may be obtained by carrying on the intensifying operation for some time, and a better print is then secured than can be got from a thin, grey negative. The clichés need not be so vigorous as in summer, and they print, indeed, much better in the dull light we are having.

As regards collodionising the plate, you very often fall into the error of pouring the liquid too thin, and this is just the reverse of what should be done. Winter plates should be spread with thick collodion, for only in this way do you get exalted sensitiveness. You may allow the collodion to flow several times up and down the plate before it is drained off, and in this way a much thicker, and consequently more sensitive, film is secured. Rather more ether should be contained in winter collodion, so that if you are in the habit (say) of mixing your solvents in the proportion of—

Alcohol	...	...	...	75 parts
Ether	...	...	...	45 "

when preparing collodion for ordinary work for the spring and summer, you may alter the proportions very profitably to—

Alcohol	...	...	...	60 parts
Ether	...	...	...	60 "

when preparing the collodion for winter use. Good receipts may be found in Vogel's Handbook.

Very important is the condition of the silver bath in winter. Everybody knows that, in the first place, the operation of sensitizing takes a long time when the bath is cold. It is therefore ridiculous to follow such people's advice who tell you always to sensitize for a period of two minutes. You should invariably leave your plate in the silver solution until all marks of greasiness over its surface have disappeared. I will not assert that the temperature interferes with the sensitiveness, but one thing is very certain: that far more alcohol and ether get into the bath in winter time than in summer. I sensitize in a horizontal dish, and I have merely to allow the bath to remain uncovered during the night in summer time to be rid of the spirit therein; but in winter this precaution does not avail me, for the alcohol and ether will not evaporate. If the alcohol should not happen to be absolutely pure, then it follows as a matter of course that a bath may get out of order in winter through the effects of cold, as it does in summer from the effects of heat. Organic substances are seen to accumulate on the plates. At first they are taken for streaks in the direction of the dip, for they all assume this position, and do not disappear on agitating the plate in the liquid. If the bath is poured out into a flat dish, and the operation of sensitizing is then proceeded with, the marks are still formed, but they proceed from the four corners, and are bent towards the middle of the plate. At the first they are of so little importance that they make no impression upon the prints, although a sharp operator will see them during the process of development. Soon, however, a lack of

sensitiveness becomes gradually perceptible, and this is the worst trait of winter photography. The best remedy against this is permanganate of potash, for the assistance of the sun in sunning the bath is not to be thought of.

One must be careful, however, not to add too much permanganate to the bath. A drop should first be put in, and then, if the reddish tint disappears rapidly, another drop is added, and so on until you remark the red tint imparted by the permanganate remains in the solution for some time; finally, as many drops of nitric acid are added as previously of the permanganate solution.

It must not be forgotten that in cold weather a warm developer should be used, as it brings out more details than a cold solution. A temperature of 15° Reaumur is the best.

These are some of the points to be taken into consideration in dull weather. It must be remembered, however, that a quick-acting lens is one of the most important things under the circumstances, for without an instrument of this kind the best chemicals will avail little. Again, one must sacrifice a little sharpness during dull weather, for to employ stops in the camera when the light is bad amounts to the same thing as drawing the curtains. Masterpieces in the way of portrait photographs cannot be expected under such disadvantageous circumstances.

THE PRACTICAL PRINTER IN AMERICA.

XXI.

TONING BATHS.

Mr. HEARN rightly remarks that, of all parts of photographic printing, this is undoubtedly the most important and difficult, with the exception, perhaps, of the management of the printing bath; and he prefaces his practical hints by a few explanatory remarks, as follow:—

"There are a great variety of toning baths in use, a great proportion of which are excellent for certain cases. We shall here give our humble thoughts or ideas in the making and care of the different toning baths, with such quotations as may be found necessary from others probably far more skilled in this branch than the author may be.

"Before proceeding further, I will explain to the beginner the reason why there is such a bath, called 'the toning bath,' used.

"The prints, as they were left in the last chapter, need some agent to remove the silver left in them, else they would continue to darken upon exposure to the light, and in a short time be so dark as to be indistinguishable. This agent is known by the name of hyposulphite of soda. If we were to place the prints as they are now directly into the soda solution, they would turn a dirty yellow colour, to get rid of which and give a more pleasing one, a bath called, as before said, 'the toning bath,' is made.

"Hence, then, the object of the toning bath is to give partly permanence, but principally to give the colour or tone to the prints, and in this colour we may expect to find brilliancy and beauty, according as to how the prints were treated while in the bath.

"In the first place, good chloride of gold is necessary in the making of these toning baths, and to those persons who do not wish to make their chloride of gold for themselves, among whom the young beginner should certainly be classed, I would advise them to purchase a stock from some reliable stockdealer. Each bottle contains fifteen grains, which may be dissolved in a bottle containing fifteen ounces of pure filtered rain or distilled water. Label this bottle, 'Stock gold solution, one grain to the ounce of water.' This solution will be slightly acid, which it should be, to prevent the light from precipitating the gold. Keep this bottle in the dark, or at least out of the brightest diffused light."

The formula for the acetate bath is well known, and need not be repeated at length here. In its simplest form

it consists in dissolving one grain of chloride of gold in ten ounces of distilled water, and adding half a drachm of acetate of soda. The bath is fit for use in a few days, and may be used over and over, simply adding fresh solution from a stock bottle, made as at first, from time to time. It should never be kept in the light. We may add here a brief explanation of the theory of the working of this bath, which Mr. Hearn does not give. Chloride of gold as commonly sold contains a trace of free hydrochloric acid, the presence of which prevents its ready decomposition. To bring it into a suitable condition for toning, this hydrochloric acid needs to be neutralized, as its presence would retard toning, and would also cause bleaching and mealiness of the prints. Hydrochloric acid, having a greater affinity for the soda than the acetic acid with which the soda is allied, gradually decomposes the acetate, forming chloride of sodium, and liberating acetic acid. The latter does not injure the prints, and facilitates toning. As the reaction takes place slowly, a day or two at least should elapse before the mixture is used for toning. It should be remembered that a trace of free acetic acid being present in the acetate toning bath, the prints should always be rinsed after the toning, before immersion in the fixing bath, otherwise a slight decomposition of the hypo., with liberation of sulphur, to the detriment of the prints, will take place.

SAL SODA* TONING BATH.

Mr. Hearn, in using the carbonate of soda bath, uses a very large proportion of the alkali, as a saturated solution may be regarded as containing in round numbers 50 per cent. of the salt; hence he uses 120 grains of carbonate of soda to 3 grains of chloride of gold.

Distilled or melted ice-water ...	64 ounces
Acid sol. chloride of gold (4 grains to the ounce) ...	1 ounce
Saturated solution sal soda ...	$\frac{1}{2}$ ounce

"The bath feels quite slippery to the fingers. Make it a full half hour before you wish to use it, and during the cold weather make it with the water slightly warm. Make it every night, and save the old solution, and throw down the gold with protosulphate of iron."

"This bath bleaches a little more than baths generally do, and so the prints should be printed quite dark. The prints when first placed in this bath will turn quite red after a minute or two, and after they have discontinued turning red watch them closely, for they will now very soon commence to tone so that you will readily notice it, and when they have once commenced to border on the tone you desire, they will very quickly arrive at the proper stage.

"In toning disregard the shadows, but watch the highlights and half tones of the face, and when they just commence to look purplish, and the red look has disappeared, they are toned, and should be immediately removed to a dish of running water. The hair, draperies, &c., may not look to be toned, but they are.

"When you are fixing these prints they will turn a variety of colours before they turn the right one, and when they turn that colour to which you toned them you may be sure they are fixed.

"CHLORIDE OF LIME BATH.

"With this bath pure whites and fine blacks can be obtained; such effects as are suitable for architectural drawings, pencil sketches, &c. It should be made forty-eight hours before use, and when about to use it add a little of the gold solution, also a little of the chloride of lime. There is considerable fault found with this, both on account of the uncertainty of its composition, and also with the various results obtained with it. That is owing to the photographer's using what is called the saturated

solution of the chloride of lime, when in many cases the solution is far short of being saturated. When you commence to make a saturated solution of this chloride of lime, and have placed nearly two ounces of the chloride in about twenty-five ounces of water, there will be a precipitate in the bottle which will make you think that the solution is saturated, since it will not dissolve upon repeated shaking of the contents; but this is simply a part of its compound (the hydrate of lime), and you can still add more of the chloride of lime to the solution before it is saturated, as this chloride is separated and dissolved, whereas another part of its composition is not, for the beginner must bear in mind that the so-called chloride of lime is a compound.

"The apprentice thus sees why he is often in difficulty in using this bath, and to obviate it we recommend that, instead of using a saturated solution, to accustom himself to weigh the chloride of lime, and then he can, after he has once started rightly, keep it always the same. This bath can be used a number of times by decanting the clear liquid out of the bottle and adding a little gold, enough to tone the prints, and a trifle of lime. It is made as follows:

Water ...	40 ounces
Chloride of lime ...	5 grains
Chloride of gold ...	4 "

The chloride of gold may be made in strength at about one grain to the ounce of water, and may be neutralized with carbonate of lime, if it is acid. If the chloride of lime bath is made as above, we do not think that there will be any difficulty in working it."

(To be continued.)

THE ART OF POPULAR ILLUSTRATION.

BY HENRY BLACKBURN.*

BESIDES the photographic processes there is the well-known French system of drawing on lithographic transfer paper, or on stone, from which relief blocks for printing with type are quickly obtained. This is largely used in France and England for periodical illustration of "the butterfly" kind, and as a substitute for the common kinds of engraving. There is also the system of drawing on waxed plates with an etching needle, which has been known for ten years, but which has only lately made much advance. In the *Portfolio* there have appeared some artistic etchings by Alfred Dawson, printed with the type; and the process is now largely used both in books and newspapers. This system, however, requires special knowledge and practice on the part of the artist on the plates, which, once attained (I believe it can be learnt in a week), produces the sharpest and best results—in fact, the nearest approach to wood engraving we have yet seen.

These two last processes are, I believe, the most suitable for making rapid illustrations for books and newspapers, it being now quite possible to make a drawing by these means at six in the evening and publish it next morning in a newspaper. That the blocks print well, and are in sufficient relief for working on cylinder machines, you will be able to judge by the specimens in the room. There are yet other relief processes, some of which, like the "Graphotype," have been known for years, and it is unnecessary to describe them. The reason for calling attention to processes generally is this, that owing to the perfection of the beautiful system of electrotyping the surface of casts in copper and steel, and to the great improvements in printing illustrations rapidly, there is an opportunity for their use which did not exist even a year ago.

Besides the above, there are, as is well-known, many other photographic processes for reproducing drawing in *fac-simile*, such as the "Autotype," the "Heliochrome," the "Woodbury," and others; but as they are not yet available for printing with type at ordinary presses, I will not

* The term Sal Soda is commonly used in America to designate common carbonate of soda, NaO CO₃ + 10 Ag.—Ed. PHOTO. NEWS.

refer to them further than to express surprise that they are not more utilized for the immediate reproduction of paintings, drawings, and sketches. On the Continent it is generally the artist's first thought to prepare a copy of his picture in monochrome on purpose for the camera, so that accurate copies are obtainable almost simultaneously with the completion of the original. The facilities for copying pictures photographically are only half-developed in this country, and the result is this, that works that would instruct and delight the public, pass direct from the studio to the lonely halls of a mansion in some private park. Not one in fifty of our best pictures are seen by the multitude, unless they happen to be exhibited for three months at Burlington House.

I shall be reminded, perhaps, that the engraver's art and the etcher's art have supplied and are supplying the public with copies of our best pictures, and, in fact, "meet the public want." But a good steel engraving takes years to produce, and is never an exact *fac-simile*. Some of the plates in the *Art Journal*, for instance, take eighteen months to produce. Consider this; a journal of art in the latter part of the nineteenth century taking more than a year to present its readers with a copy of a picture! I am thinking at the moment more of the title, and what a real *Art Journal* might be with the present facilities of reproduction at command. The excellent publication which bears this name, and in which *fac-similes* of Sir Edwin Landseer's sketches are now appearing, hits off, I believe, exactly the public taste, and need not be disturbed, for it is doing good and useful work; but my theory of an "art journal" is a paper that should present to its readers, in some pictorial form, monthly (or weekly would be better) the artistic events of the day, and give in outline (on some such plan as I have suggested) an idea of the composition and leading lines of every new picture as soon as it is exhibited.

Let us not be blind to the fact that the public is, as a rule, either impatient or indifferent; that if you do not give it a good thing quickly, it will take a bad one. We who have only a few years to live, and many of us really only a few hours left to devote to art, cannot rest content with a process that reproduces one work in two or three years.* Let the originator devote half a life-time to a picture if he will, and if his health and enthusiasm hold out well; but for reproduction in the press let us use the quickest and truest method that science can now supply. That method at the present moment seems to be wood-engraving, which, in its quality of work, aided by good printing, almost approaches steel. Looking at the wood-engravings in the leading illustrated newspapers and at the publications of such houses as the Messrs. Cassell (I mention them because they represent, perhaps, the distribution of the largest numbers of cheap and good pictures), there would seem little left to be done. But we are moving on, and on, I believe, to a more artistic period still, when, by the power of photography, we shall attain far more simplicity and truth in popular illustration.

It was gravely argued lately, at one of our learned societies, that the art of printing was, after all, but a questionable blessing, on account of the amount of error and evil disseminated by it. Without going into that question, I think we may find (if in these terrible hurrying days we had time to think) that the art of printing with movable type has led to some neglect of the art of expressing ourselves pictorially, and that the apparently inexorable necessity of running every word and thought into uniform lines has actually cramped and limited our powers of expression and of communicating ideas to each other. The child of three years old endeavours to express itself pictorially, but when it puts forth its hand to draw, there is no one to guide it. It has been born in an age of advanced civilisation, which knows no method of expression for the young but one—

"pothooks and hangers"—and so for seven years of its growing life the subtle fingers are cramped to the achievement of parallel lines; and when the day comes to "learn to draw," say at ten years old, the delicate index is less sensitive, and much of the freedom and power of expression by the hand has gone for ever. That is the experience of most of us in this room, but happily no longer so with the young; therefore there is hope that, even in our generation, we may see a great advance.

With the means now at command for reproducing any lines drawn or written in perfect *fac-simile*, mounted on squared blocks to range with the type, giving little or no trouble to the printer, we should more frequently see the handwork of the author and the artist appearing on our pages. We need not fear the multiplication of much crude amateur work by these means—our publishers will take care of that—but we should infuse more character and originality into every publication that comes from the press; and when I speak of originality, I refer specially to the originality of the author. The fact is, that in all our books, but especially in books on art, and "editions of luxury," we are too neat and tidy. We fall submissively into the same mechanical toils, our noblest thoughts are printed like our weakest, and are all run out in lines together, as in the making of macaroni. I fancy the editor of that most artistic periodical, the *Portfolio*, must often chafe under the mechanical restraints imposed upon him. Think what increased interest would have attached to his papers on "The Sylvan Year" if a spray of grass, or leaf, or rare flower had been permitted upon the page—if it had not been swept so clean, if its forest walks had not been so highly rolled.

It is all a question of fashion, but the fashion may change suddenly, and a call be made upon us to produce more numerous but less elaborate illustrations. Let us, then, cultivate more systematically in our schools the art of drawing for the press, and treat it as a worthy profession. Let it not be said again, as it was to me to-day by one who has devoted half a life to these things, "The processes of reproduction are to hand: where are your artists?" There is the talent amongst us, the power of expressing ourselves pictorially to a much greater extent than we are aware of. It is in this room to-night, but it plays about us like summer lightning, whereas we want the precision and accuracy of the telegraph.

In conclusion, shall it be said of our artists that the chariot wheels of the press move too fast for them—that chemistry and the sun's rays have been utilized too soon—that, in short, the processes of reproduction have been perfected before their time? I think not, and that an art which has existed for ages, and is now best understood by the Japanese, may be cultivated amongst us to a more practical end.

PHOTOGRAPHIC OPERATIONS IN EGYPT IN CONNECTION WITH THE LATE TRANSIT OF VENUS.

BY CAPTAIN ABNEY.*

SOME gentlemen apparently seem to find this albumen-beer process not answer, and lay it to the beer. I cannot say if it be the cause; all I can say is, that any beer seems to give me equally good results, and I have tried many. One thing, I think, may affect sensitiveness, and that is the collodion. I make mine rotten with water, and then add the same unwatered collodion to it till all "crapiness" disappears from the film. I lay great stress upon this point, as I believe the constitution of the pyroxyline is altered by it, and certainly the film becomes more porous. At all events, at Chatham the process is a general favourite with the men and officers; and we stick to it, as we find it the most manageable, and the easiest to teach.

* According to Mr. Hamerton, there are in some etchings more than three hundred thousand strokes of the hand.

* Continued from page 164.

I am not aware who introduced the gelatine* substratum as it stands. I know it has often been tried before, and failed to give satisfaction. When used with a Blanchard brush, it is first-rate.

Such is the process adopted at all stations belonging to the British expeditions, and I hear that it has been carried out most successfully and with less drawbacks than I had in Egypt.

On the day of the transit we exposed a plate about every one and a-half minute during the transit, beginning about twenty minutes after sunrise, and finishing twelve minutes before internal contact. This gave us about forty plates to expose. As a fact, we exposed about forty-five. Just before internal contact, the Janssen slide, which was placed ready in position, was exposed. As you are aware, each plate is made to bear fifty different impressions, at intervals of one second of time; and, by so doing, very small differences of interval between the limb of Venus and the sun are obtained, and will be used for micrometric measurements. As the time of each exposure is accurately known, the results will be valuable. M. Janssen had the credit of first publicly proposing this plan, though it is a method that would have struck any one who was accustomed to a repeating back in a camera. Mr. Christie designed the form we used, and very ingenious it is. Mr. Dallmeyer carried out the design with his usual ability. More Janssen plates were exposed in the interval between internal and external contact; and the measurement of the cusps will be very valuable, a small difference in the apparent places of the sun and Venus being magnified largely as the limb of the latter is just leaving the former.

The manner we carried out our arrangements during the time was this:—We had six slides and twelve boxes to hold six plates each. These were all lettered, and each plate, in addition to lettering, was numbered from 1 to 6. The whole of the slides, which were numbered from 1 to 6 as well, were filled from one box by one man inside the dark room, and passed out to the Sapper attending on me. As each plate was exposed, it was passed into the dark room through a different aperture, taken out of the slide by a second Sapper in the dark room, placed in its own groove, and the slide passed to be filled from the next box. I personally placed the slide in the photoheliograph, exposed each plate, taking up the time from my chronometer, and registered the number of the plate as shown on the back, together with the exact time of exposure. The first, thirteenth, and every twelfth plate after were developed during the transit, and the time of exposure was regulated according to the appearance of the image. Naturally, at last, the plates got shorter exposure than they did near sunrise. When we first saw Venus on the sun's disk she was most unsteady; one photograph shows her as a square with rounded corners. The atmosphere was anything but still, the limb of the sun till very nearly internal contact appearing to boil. A fact worthy of remark is, that with dry plates, with the same exposure, the irregularity caused by this atmospheric disturbance is much less marked than with wet plates. I think I can assign a reason for it which is too long to enter into here.

Directly after the transit had finished, the remaining plates were developed. This operation took till the evening. I believe the pictures we brought back have given satisfaction to the Astronomer-Royal, and no higher meed of praise do I desire. From first to last I have found it easy to work for that distinguished gentleman, his clear conception, grasp of mind, and accuracy of thought invariably helping me in any difficulties that have arisen. From our President I received the greatest encouragement at Greenwich.

It is rather the fashion to despise military routine; but I can honestly say that had it not been for military discipline and drill—irksome drill—I believe I could not have carried out all that I desired; as it was, the only hitch on

the day that occurred was my fault, and not that of any of my subordinates. It was not a great matter, simply forgetting, in one instance, a word of command. As it happened, the mistake was advantageous, as I got a result which I should otherwise not have obtained. The transit-day over, we took two or three days of rest. Personally I was glad of it, as I believe even the most placid of men would suffer from the excitement of two hours' intense strain on the nerves. Much had still to be done in the way of making duplicates of the negatives; and here we encountered much difficulty. Transparencies are generally easy to make; but, owing to the necessary thinness of the negatives, we found it no easy task.* At length I hit on a mode which carried success. It was this: I printed the image on the dry plate prepared as above. The sun appeared to be on unaltered bromo-iodide, whilst the sky was quite strong by reflected light. I then intensified with a wash of—

Pyro	...	...	...	...	...	1 grain
Citric acid	...	...	...	...	...	20 grains

with two or three drops of 20-grain solution of silver. This answered admirably for our purpose, and the sharpness is fairly equal to the original. These transparencies we accomplished in a cruise we took up the river, when we paid a flying visit to Assouan, the First Cataract, and Philæ, getting back to Thebes for Christmas Day. I packed up the hut on board a country boat, and started homewards on December 27. It was an unexciting process floating down the stream back again to Cairo, though helped by eight oars. However, we found plenty to do in packing up our small traps; and we reached Cairo on January 3. I have not touched on other photographic work than that of the transit of Venus. There is much of interest in it; but time forbids that I should enter into that subject. Suffice it to say that the Nile voyage, undertaken with a view to photography alone, is most enjoyable. Egypt is delightful in almost everything except in the system of backsheesh and in mosquitoes, and these latter you lose at Thebes.

I cannot close this paper without referring to the kindness we received from the authorities. The Khedive gave us everything we required; he franked our baggage from Suez to Cairo, and back from Cairo to Suez; he gave us guards, tents, and police; he put at our disposal a steam-tug, and aided us in every possible way, even allowing us the free use of the telegraph for about fourteen hours to obtain our longitude at Thebes. The Eastern-Telegraph managers, Mr. Gibbs and Mr. Cross, were simply invaluable; and Mr. George, an Englishman at the head of the Egyptian telegraphs, went to great personal inconvenience to help us in getting through our time-signals. I have been officially in several foreign countries, and certainly never met with so much courtesy as we received in Egypt. Captain Browne, the head of the expedition at Cairo, reports equally favourably; and the English Government, I fancy, have given an official acknowledgment of it. Our success the authorities looked on as their own, and none more heartily congratulated us than they did. Never were expeditions more carefully planned and organized than they were by Sir G. Airy; and though, perhaps, rather expensive, I know I am right in saying that there was here no breakdown due to anybody connected with it. Although New Zealand was unfortunate, I am sure my brother officers there were as well (if not better) prepared than the rest of us.

* The negatives were necessarily thin to allow of measurement.

TO CEMENT METAL TO GLASS.—Mix two parts powders boiled litharge and one part dry white lead into a dough with white linseed oil and lac copal. The metal is to be coated with the cement, and then pressed upon the glass.—*Scientific American*.

* Since writing the paper I find it was Mr. Tunny.

The Photographic News.

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REJLANDER MEMORIAL FUND.

A BRIEF announcement in our business columns informs photographers that a committee has been constituted for the purpose of receiving subscriptions towards a fund tributary to the memory of the late O. G. Rejlander. As we know that there are many of our readers who will gladly contribute to a fund for the purpose in view, we shall very briefly explain the object contemplated. Mr. Rejlander, as most photographers know, was not successful in a pecuniary sense. A passionate lover of his art, he was at all times more earnestly engaged in developing and illustrating its pictorial capacities, than in securing the legitimate monetary results of such work. With wonderful fertility of invention, rare originality, admirable art knowledge and culture, great industry, and without a little of the *feu sacré* of genius, Mr. Rejlander did not possess the useful, if vulgar, faculty of making money. Without being regardless of business, or negligent of business, he was not a business man; and so far as making a fortune constitutes success, his life was a failure. His was the higher success by which photography, and all associated with it, gain, of elevating his art, of doing much of the noblest pictorial work possible in painting with sunbeams. It was impossible, with such fecundity as well as excellence of production as a study of portfolios illustrates, for the artist to have been absolutely impecunious; but the protracted illness which preceded Mr. Rejlander's death, which absolutely prevented work, whilst business obligations were accumulating, inevitably issued in pecuniary complications and embarrassment.

Mr. Rejlander left a widow, who was, fortunately, in photographic matters, a help-meet for him. In a dying request made to us personally, he referred to the monetary obligations which had accumulated during his illness, and to the future of his wife. If the obligations to which he referred could be satisfied, and the peaceful possession of his photographic effects, especially the subject negatives, with the printing and publishing of which she was personally familiar, could be guaranteed to his wife, her future would, he thought, be fairly provided for; and he added a conviction that there were many photographers who had sufficiently kindly remembrance of him to aid in bringing about such a result.

We appeal, then, to photographers in a twofold sense. We ask those who knew and loved Mr. Rejlander, and those who admired his great genius, to contribute to place his widow in the position of honourable independence which she can secure by the continued printing and publishing of his works. And we ask all photographers to contribute to the fitting memorial which such a fund, and such disposal of it, will form, to one who did so much to

elevate their art, who did so much to diffuse art feeling amongst photographers in teaching by example, showing what was pictorially possible in photography, and stimulating effort by the marvellously beautiful results he produced in such prodigal succession for many years. Looking at the matter in this sense, there is possibly scarcely a photographer who is not indebted to Mr. Rejlander. If a tithe of these debts be discharged, an ample fund, worthy of Rejlander's name, and in every way adequate to the fulfilment of his wishes in regard to the widowed lady he has left, will be obtained.

A small committee, of whom Sir Coutts Lindsay, Bart., the friend and patron of Rejlander, is Chairman; Mr. F. W. Mills, Secretary; and Mr. H. Baden Pritchard, Treasurer, is already formed; but the co-operation of other gentlemen who knew and admired Rejlander, especially some in the North, is desired, and the Committee will gladly hear from any who are interested in the matter. Contributions should be forwarded to Mr. Pritchard, at the Chemical Department of the Arsenal, Woolwich. The names of a complete committee will in due time be announced.

OBITUARY.—THOMAS SUTTON, B.A.

WE announce, with deep regret, the death of a gentleman whose name, for upwards of twenty years past, has been one of the most familiar to all readers of photographic literature. After a very brief illness, Mr. Thomas Sutton, B.A., departed this life on the nineteenth of March, in the fifty-sixth year of his age. For some years past Mr. Sutton's health has been considerably shaken. Upwards of twelve months ago he informed us that he had been for some time a constant sufferer from dyspepsia, the symptoms of which had been, we understand, considerably aggravated for some time before his death, which was eventually very sudden. After two days' confinement to his bed, he succumbed to a sudden seizure of cramp in the stomach, from which he was released by death in a few hours.

Son of a gentleman of scholarly tastes residing at Kensington, whose name was familiar to numismatists, Mr. Sutton was born and educated in the neighbourhood of London, having been at one time a pupil of the present esteemed president of the South London Photographic Society, the Rev. F. F. Statham, M.A. At Cambridge, as a member of Caius College, he was distinguished as an ardent student and good mathematician, and acquired his degree of B.A., taking position as twenty-seventh wrangler in 1846. In the following year he went to Jersey with a student with whom he was reading in the capacity of tutor, and there resided many years, devoting himself to photographic research and contribution to photographic literature. In 1856 he commenced the issue of a monthly journal entitled *Photographic Notes*, which, for some years, was conducted with great vigour and interest. This journal was finally merged into the *Pictorial Photographer*, which, after a struggling existence of a year or two, dropped out of existence. In 1861 Mr. Sutton was appointed successor to Mr. Hardwich as Lecturer on Photography at King's College, a position he resigned in a few months, finding residence amid the turmoil of the great metropolis congenial to his tastes and habits. He returned to Jersey, and subsequently resided at Redon, in Brittany, where he undertook the duties of French Correspondent to a weekly contemporary. For the last few months he had been residing in North Wales, where he died.

Our personal knowledge of Mr. Sutton commenced in 1859, when we visited him in Jersey, and commenced an intimate friendship, which was maintained for many years, although somewhat interrupted by the polemics and politics which, in the history of photography, have at times been unfortunately conducted with a degree of warmth altogether beyond the adequacy of the occasions. None know better than ourselves, and none can more willingly testify that he was a writer of great ability, and a keen,

ardent, and enthusiastic experimentalist, the varying and occasionally contradictory character of his utterances being largely due to this enthusiasm. He wrote with a degree of trenchant vigour which, whilst it always possessed a charm, at times, on polemical subjects, suggested a rancour which had, in reality, no part in its origin. Few persons who met the deceased gentleman personally were prepared by their study of some of his writings for the winning, genial, gentle, and frank modesty of his personal bearing.

But whilst his name is most familiar to photographers in connection with photographic literature, it will also be associated with many practical points in the progress of the art. In the early days none strove more energetically than he to secure attention for permanent printing, whether by carbon or various other processes, and many of his improvements in ordinary printing were of great value at the time of their publication. His experiments in the manufacture of collodion, and his introduction of his alcoholic collodion, did much to revolutionize the system in which a very large proportion of ether—at one time common, if not universal—was regarded as imperative. His early experiments in the manufacture of pyroxyline issued in practical formulæ by far the most trustworthy of any at the time issued. Without entering into detail, it may be fairly said that, as an experimentalist in almost every department of photography, he left much on record in connection with all, which was read with interest and instruction, even by those who felt it necessary on many points to dissent from his conclusions.

"ANOTHER NEW SWINDLE."

A LETTER to a daily contemporary, the *Standard*, appeared a few days ago with the above heading, in which the writer grows eloquently indignant at another method by which the art in which all our readers are interested is employed, as he alleges, to swindle the public. It is somewhat amusing to contemplate the indignation about so small a matter which induced the writer to send a letter to a daily contemporary in complaint or warning, and not less amusing to find that, with every facility to ascertain whether there was really any swindle intended, no such attempt appears to have been made. We will print the letter, which will best explain the ground of complaint.

To the Editor of the STANDARD.

SIR,—As you so kindly open your columns to warnings to those who are easily imposed upon, may I ask that you will give publicity to the following?

On the 22nd of February last, and several preceding and succeeding days, two itinerant photographers were in the neighbourhood of Surbiton taking photographs of the different houses, with the ostensible purpose of bringing into notice some new American process of photography. They made no charge for taking the photograph, only asking as a favour that the lady of the house or the children and servants would stand to make up the picture. Having obtained this favour and the photograph taken, it was an easy matter to induce the servants to bespeak copies, which of course had to be paid for at once. A receipt was given on the back of a card which bears a name and address it is not necessary to mention. It is sufficient to say that no copies have ever been sent, and that letters sent to the address given meet with no response. I understand that many servants and others have been induced to part with their money, and I write this trusting that it may be a warning to others not to be so foolish. I may add that in cases where payment was declined until copies were sent no copies have been sent.—Your obedient servant, J.

On reading this letter, two very obvious considerations present themselves. In the first place, a little reflection might have suggested to the letter writer the improbability of two photographers dragging about apparatus, expending time and material in taking groups of the "lady of the house" and children, on the mere chance of inducing the "servants" to bespeak copies, and pay for them in advance. It is possible that some photographers may be enterprising enough to engage in peripatetic portraiture; but the notion of taking groups of the family on the chance of selling a few prints to servants, or even of obtaining the price of the prints without supplying them, does not seem a promising or probable form of speculation. But we are informed that

a receipt was given on a business card, containing name and address, which it is not alleged were fictitious. This being so, where was the swindle? At worst there is a tardy performance of contract. That a few weeks should elapse in winter between receiving an order, even with cash in advance, and supplying prints, may be a grievance, but if it be regarded as evidence of intention to swindle, we fear that the reputation of many professional photographers will be in danger.

SIZE AND PROPORTION IN PORTRAITURE.

BY ROBERT FAULKNER.

THE introduction of a new size for photographic portraiture, though not an event to be marked as a red-letter day in the calendar of photography, cannot but be interesting to those engaged in the production of pictures by the camera. The commercial aspect of the question has been considered, but its merits from a fine art point of view seem to have been forgotten or ignored. Yet, in my humble opinion, it is not a subject altogether unworthy of a little thought. Photographic writers are very apt to refer to the works of Vandyke, Reynolds, Gainsborough, and such luminaries in art, and this fact induces me to give a list of the sizes of the various canvases employed by those great men in the production of their portraits, viz. :—

	Feet	Inches		Feet	Inches
Head	2	—	by	1	8
Three-quarter	2	6	by	2	1
Kit-kat	3	—	by	2	4
Small half-length	3	8	by	3	4
Half-length	4	2	by	3	8
Bishop's half-length	4	8	by	3	8
Whole-length sitting	6	—	by	4	—
Whole-length	7	10	by	4	10
Large whole-length	8	10	by	5	10

If it is conceded that the works of these artists are worthy of imitation, then, I think, the sizes they adopted should be the basis of the scale for the dimensions of our pictures. Exceptions might be found to some, but certainly three of them—the whole-length, half-length, three-quarter or head-size—should be scaled on the above proportions. The main difficulty in adopting these measurements lies with the manufacturers. They appear to have come to the conclusion, that only one size is good for the purpose—and that size is the mean and lanky carte-de-visite. If you attempt to discuss the matter with a maker of photographic frames, he will rejoin, "We study the requirements of the public, and not the caprices of photographers. We find the frames and albums we manufacture sell well enough—that is sufficient for us." These commercial despots forget that a good shaped frame or album has not yet been made, and consequently the public has not had an opportunity of escaping from the regulation pattern, and adopting a good thing. I may remind them that many people of refined taste repudiate albums altogether, preferring to keep their pictures in boxes. If, in spite of reason and taste, manufacturers still refuse to provide albums containing three sizes, surely a medium size—similar to the cabinet, but larger—should be selected. This, although a little too wide for a whole-length, is admirably adapted for the half-length, three-quarter or head-size.

Our lawgivers, the manufacturers, should have some pressure put upon them to ensure their adhering to the sizes selected, otherwise they will deviate a quarter of an inch one way or the other, as I have experienced more than once.

A writer on art has said: "Proportion is the basis of beauty." Again, "Excellence is made up of the little more or the little less" (I quote from memory). These golden axioms apply with peculiar force to photography, which, being so poor in resources, should seize upon every judicious expedient to promote its excellence, even in the apparently trifling matter of the proportions of frames and mounts.

ALBUMEN AS A PRELIMINARY COAT FOR GLASS PLATES.

BY A. BORLAND.

In reading some of the articles in the NEWS and YEAR-BOOK, I have been surprised to find that the writers of them speak disparagingly of, or altogether condemn, the use of a preliminary coat of albumen. My surprise has been great from the fact that I have had several years' experience in the use of a substratum of albumen, and I have always found it trustworthy when properly applied.

Amongst the many sins laid to its charge I find the following:—First, that it is a prolific source of spots and streaks; second, that it increases the exposure in the camera; third, that when used as a preliminary coat for collodio-chloride pictures it is a cause of fading; fourthly, that it is not always possible to obtain fresh eggs, and that store eggs are not to be depended on. These are very strong objections, but still I think I shall be able to give a good answer to all of them.

To begin with the last first, I am happy to say that there is no need for running after fresh eggs, as the dried albumen of commerce answers the purpose quite as well when properly treated. My own plan of preparing a stock solution is as follows:—To one ounce of distilled water add one drachm of the dried albumen, and two or three drops of strong ammonia. The ammonia is not added for the purpose of making the albumen keep, but for the purpose of making it dissolve more completely. That it does so may be easily proved by omitting the ammonia, and, after the albumen has apparently all dissolved, allowing it to stand for an hour or two, when the albumen will be seen to have settled to the bottom, leaving the water almost clear. Now add the ammonia and shake slightly, and again allow to stand, and it will be seen that no change takes place. If the stock is wanted to keep, a few drops of carbolic acid may be added to each ounce of solution, and it will then keep for some time.

To the third objection I have to say that the evil is caused by using the albumen too strong, one ounce of the stock solution in about thirty ounces of water being quite strong enough to answer the purpose it is intended for—namely, to keep the film on the plate; and it does this so well that the picture may be washed until every trace of hypo used in fixing is removed, which cannot be done without great risk where no albumen is used.

But I think I hear some one say, That does not dispose of the albumenate of silver formed in the film. My answer to that is, that plates prepared in this way may be exposed to strong sunlight for months, and no change can be seen after the most careful inspection, the film of albumen being so very thin that any discolouration from the effects of light is not perceptible, and the coat of collodion is a good protection from atmospheric influences.

To the second objection I give the same answer as to the third; viz., too much albumen is used.

In answer to the first objection, I think I cannot do better than state in full my mode of operation in the application of a substratum of albumen; and to those who will try it fairly I can promise the same success that I have always had with it. I may say, first of all, that my experience was gained whilst working as operator in America, where it is used by almost every one. The firm I worked for very kindly provided a boy whose duty it was to clean glass; but although I superintended the work, I could not always depend upon having clean plates, although I believe the boy did the work as carefully as he could; but in this, as in cleaning glass by the ordinary method, there are many little things require attention which none but a person of experience can see the good of; and for this reason I determined to undertake the albumenizing of glass for my own use, and I found myself a gainer by the operation, as I hardly ever had a dirty plate, or a film leave the glass afterwards—a matter of great importance when plates up to 14 by 17 are in constant use.

It is best to prepare enough at one time to last about a week, the following being the order in which I do the work:—In the morning, before commencing other work, put a drachm of albumen to soak in one ounce of distilled water, and add two or three drops of strong ammonia; it will be ready for use in the afternoon, when it must be added to about thirty ounces of tap water, and filtered through paper, when it is ready to be poured on the plates. If new plates are to be used, they should have the sharp edges taken off by drawing them over each other from corner to corner, after which they are put, one at a time, into a solution of sulphuric acid and water (about one ounce of acid to twenty ounces of water), and allowed to remain until the afternoon. If old varnished negatives are to be used, they are put into a strong solution of printer's lye, and allowed to remain for a day or so, and then taken out and rubbed over with a piece of rough felt, washed under the tap, and then put into the acid, the same as new glass. The albumen having been filtered into a beaker glass or graduate, a plate is taken from the acid solution, and, after giving it a slight rub on both sides with a piece of felt, it is washed well under the tap, and, after draining for a few seconds, it is placed on the tips of the fingers, and a small quantity of the albumen poured on to the plate and allowed to flow all over, which it does freely, driving the water that remains before it. Do not pour back into the beaker, but allow to run into the sink, and then pour on some more of the albumen, and flow over as before, this time, however, pouring it back into the glass, being careful to let it run down the side of the glass, so that it may not cause bubbles. Stand the plates in a rack where they will be free from dust. Be very careful, when putting them in the rack, not to take hold of the top corner, as doing so is sure to cause streaks across the plate. When quite dry, they may be stored in plate-boxes, or placed together in the usual way on a shelf.

Plates prepared in this way will be found free from all spots and streaks that may be caused by the use of albumen; and the great freedom with which negatives may be washed after the various operations adds very much to the comfort of the operator, in removing all fear of the film leaving the glass, or from stains caused by insufficient washing where such fear exists, and there can be no doubt that negatives that have been well washed are much less liable to cracking of the film than those that have been but slightly washed.

I leave these few rambling remarks in the hands of the fraternity, and hope they may be of some service to all who read them.

A MATT VARNISH.*

BY ANTONIE BOONER.

It is known that a film of normal collodion coloured with fuchsine gives the most delicate and uniform covering to a negative, and that by its use vigorous shadows may be produced, but not lights. I have found it very good for thin negatives and such as are of good quality, but the retoucher must handle the film delicately, as it is easily injured. One method of producing a mat colourless, tough, and permanent film is to be found in negative varnish to which a little tartaric acid has been added, the mixture being shaken occasionally, and allowed to stand for some days. This somewhat rough varnish permits retouching with the greatest facility; lights may be put in, or the film may be scraped, no delicate handling of the basis being necessary. But success is not always certain when a commercial varnish is employed. It sometimes happens that waves are formed (if shellac is present), or the dried film shows white streaks, and when these are removed the surface underneath is glossy. Nevertheless a good result is secured in most cases. The best and most certain result is obtained by means of a mixture of normal collodion and commercial amber varnish;

* *Photographische Correspondenz.*

the plain collodion is diluted with ether and alcohol until it contains three per. cent. of pyroxilin, and then so much amber varnish is added as will render the mixture somewhat darker than olive oil in colour. One cannot be very precise with the details, because the consistence of the amber varnish obtained in commerce continually varies. The mixture is shaken, filtered through cotton-wool, and applied like ordinary collodion; it gives at first a dense, milky, and not very trustworthy film, but while drying the film becomes very pure and fine, and perfectly uniform in character, its surface being such as it would be impossible to produce upon ordinary glass, either by mechanical or chemical means. In the space of fifteen minutes after the varnish has been applied, the film is dry in an ordinary temperature, and may be worked upon with a little care. If, however, it is left to become thoroughly desiccated, requiring less time to do so than ordinary varnish, it permits of the application of high lights, the firm basis allowing the pencil marks to be made with certainty and uniformity. That it permits of scraping, and that it withstands the influence of moisture and is a protection during the printing process, follow as matters of course.

Experiments with the colouring of this varnish, which is only necessary in very few cases, I have not carried far; but I may mention that a fair result may be secured by the use of gum tragacanth. Among the aniline colours there are only few that can be made use of. Fuchsine is decomposed in contact with amber, shellac, or other resins, into a disagreeable lavender blue, and coraline seems to exert an injurious influence upon the tone of the prints. The employment of aniline blue is not possible, because of its liability to change and its behaviour in reference to actinic light; and picric acid is useless from many reasons. There remain, therefore, only violet and green, or mixtures, or certain vegetable colours to experiment with. The varnish may, however, be tinted with aniline blue, and thus made to yield a matt blue surface, which would no doubt be grateful to the retoucher's eyesight.

For negatives of large dimensions, which require a good covering, I employ thin paper—either tissue, French, vegetable, or even writing paper, according to circumstances. The reverse side of the negative is used, and the paper is stretched moist and attached to the margins; it then becomes smooth when perfectly dry. I employ Harlemer siccatif diluted with alcohol to make transparent patches, and graphite or colours are applied for covering.

HOW TO AVOID UNNECESSARY WASTE OF SILVER AND GOLD.

BY E. Z. WEBSTER.*

AGAIN, "after many days," I take up my pen to bring to a close the series of articles upon this subject.

A paper which I had prepared, showing the immense waste of time, silver, and paper which might be avoided in the printing department of photography, I feel constrained to omit, because I have already made myself rather prolix. We will take up the subject where the pictures are ready for the toning.

Without stopping to discuss the subject of toning baths, we will suppose that you are using the common bicarbonate, or sal soda, or any other toning bath which is generally thrown aside when the batch of prints is toned; now, instead of throwing it away, pour it into a bottle, and do the same next time, and again if necessary; by that time enough old toning solution has accumulated with which we can proceed to the next operation, which will be the

Fixing or *hypo* bath. Now, instead of using plain water, take the old toning solution, and make your fixing bath of that, and when the prints are fixed, pour off the solution into another bottle, add a few crystals of hypo to insure

saturation, and let it stand till the next batch of prints is ready, and use it again, and even once more if there be not sufficient old toning solution to make another. You need not be afraid of sulphur toning; make it strong, and keep it so. And when you are done with the old fixing or hypo solution for prints, pour it into the tray wherein your negatives are fixed. The tray should be at least 20 by 24 inches by 3 inches deep, made of wood if you like, and watertight, of course.

Here you have the routine; now we will go back and get the whys and wherefores.

In the first place, you know the general rule for toning is about one grain of gold to one sheet of paper, but there always remains a goodly portion of the gold in the solution when you are done, and to utilize that gold we will put it into the hypo or fixing bath, where it adds to the depth and beauty of the toning, instead of allowing the raw soda to destroy a portion of what the prints already contain, thereby obviating the necessity of carrying the first toning so far, and requiring less over-printing, and from one-third to one-half less gold.

Secondly.—By using the paper "fixing" solution in the negative "fixing" tray, the same is not only made to do double duty, but the silver contained therein has a beneficial effect upon the negative film, as it tends to prevent the soda from attacking the delicate detail in the shadows, and leaves upon the surface an extremely thin translucent veil, which adds to the softness and beauty of the print.

Thirdly.—The negative fixing tray being large, several negatives can lie in the solution at once if necessary, and the broad surface of solution exposed accelerates evaporation, by which means the tray is kept in good working condition, by the additions from the print "fixing" solution, but sometimes requiring fresh water, and occasionally getting too full, depending altogether upon the amount of water used in your toning and "fixing," and the state of the atmosphere. When the solution becomes syrupy, pour it off and precipitate the silver with some pieces of zinc, and submit the precipitate to the action of hydrochloric acid; wash the precipitate thoroughly, then reduce the same with nitric acid, then add water, neutralize with ammonia, and use it; or you can put a piece of copper into the fixing tray and let it remain; the silver will gradually collect upon the surface of the copper in the form of pure metallic silver, requiring only to be submitted to the action of diluted nitric acid to be converted into nitrate of silver.

Finally, by following the foregoing routine more silver can be saved than by any other means; and that the plan will work I will guarantee, as several years of constant use and practice of the same has satisfied me of its merits.

In these papers I have made it a point to suggest the simplest possible means adapted to the ends, knowing that the great mass of my brother photographers have neither the means nor inclination to adopt expensive or complicated measures. I have merely sketched an outline of a plan, to illustrate and cover a principle; and that is, a simple and inexpensive means by which you can avoid unnecessary waste of silver. And if my efforts should prove beneficial to some of my poor "shadow catching" brethren, I shall be satisfied; however, such as it is, you have it, with my best wishes.

RETOUCHING WRINKLES.

BY A. DUMBLE.*

THOUGH thoroughly versed in the various branches of the profession, my attention for the past few years has been especially directed to the retouching of negatives. This ground has been so often discussed that I feel a diffidence

in approaching the subject; but long practice and careful study have developed a few ideas which I have never seen in print, and which have been so invaluable to me, that by your leave I present them to your readers.

I found, in retouching very freckled faces, and particularly large negatives, a great difficulty in making my ground surface take lead in a becoming manner. All retouchers know that this is a very essential virtue where, either through the carelessness of the operator, or some peculiarity of the subject, the negative requires a large amount of work.

By dissolving a portion of Venice turpentine in my varnish, I found that I could obtain any grain or surface I desired. This in a gallery making from thirty to forty negatives daily the year round, each and all requiring the most skilful and delicate handling, was of no little service, as you may suppose.

In fact, I soon discovered that a few minutes spent once a month in the varnish room saved an infinite amount of labour and time. Now a large negative requires different treatment from a small one: where the touch on one is fine and delicate, on the other it should be bold and effective, so my varnish simply consists of two brands, one giving that fine biting grain so essential to good and speedy work on small negatives, the other a coarser, hungrier tooth, which enables me to go over a life-size in fine style. There are two great objections to grinding the surface. 1st. It befogs the negative. One cannot confine it to those parts alone requiring lead, but must rub indiscriminately over eyes, nostrils, portions of the hair, and background. 2nd. The retouching is easily marred, either in careless handling, or the necessary process of printing. And how aggravating, my brothers, when our annual exhibition, or the Centennial, or something comes round, to take from your racks the choicest fruits of a year's hard labour, and find them almost in a state of nature, with but a few disconsolate particles of lead remaining to speak of better days.

These difficulties I overcome in this way, and if there is a better I am open to conviction. After retouching I hold the negative to the fire, butter side to the stove, heat evenly a few seconds, and—*presto!* Each individual particle of lead that a moment before was upon the surface has taken by its own weight a corresponding position on the glass, while over it is spread a glossy coat of varnish. Thus the retouching is embalmed, as it were, and secure from harm, while the varnish interposing between the lead and the paper gives an admirable softness and delicacy to the finished print.

But sometimes it is desirable to retain the extra density caused by grinding the surface, as in a poor copy or a too thin negative of any kind. In such case, after it is retouched, I take a little thin gum-arabic, and with my brush go carefully over those parts that I wish to print sharp and clear, viz., eyes, eyebrows, whiskers, moustache, and the hair and background in the vicinity of the face. I may say here that this one practice has enabled me to save many a negative that would otherwise have been absolutely worthless.

Someone asks, is there not great danger of smashing the negative in the burning-in process mentioned above? No, with any reasonable amount of care. All the negatives in Mr. Keat's gallery, from card to life size, are burned in, and that fact alone will be sufficient proof of its value. We never break a negative in that way.

CLEANING; FROSTING, AND LACQUERING BRASS.*

TAKING into consideration the numerous weekly applications made to us for information on the above processes, we have thought well to append the following recipes, which will be found practicable and trustworthy:—

To clean tarnished brass having flat, or nearly flat, sur-

* *English Mechanic.*

faces.—Make a saturated solution of oxalic acid in water. Rub briskly over the tarnished surface with a firm roll of clean flannel dipped in the acid solution. When the tarnished appearance has been removed, remove all traces of acid by swilling the article in an abundance of water. Dry quickly with a warm rag, and bring up the polish with a soft leather and a little of the finest washed whiting.

To clean surfaces which are embossed or deeply under-cut.—Make a mixture of one part nitric acid, two parts water, and six parts hydrochloric acid. Boil the articles to be cleaned in a strong soda-ley, and then leave them in the above solution until they become covered with a black layer. Now remove from the mixed acid, rinse in plenty of water, and use a fine scratch-brush to remove the black mud. When clean, rinse in hot water, and dry in hot sawdust. Articles thus treated acquire a brilliant lustre. Should it be desirable to give a very rich orange-yellow tone to the brass, the nitric acid in the last recipe may be advantageously replaced by an equivalent weight of powdered alum.

To produce a dead appearance.—This, called by the French *mat*, may be obtained by plunging the articles in a mixture of strong nitric acid 200 parts, sulphuric acid (sp. g. 1.845) 100 parts, common salt 1 part, sulphate of zinc 2 parts. The articles will require thorough rinsing. Another recipe, suitable for large work, consists of: nitric acid 3 parts, sulphuric acid 1 part, water 1 part, sulphate of zinc $\frac{1}{2}$ part. Dip the articles and rinse, again dip and rinse, until the earthy yellowish dullness gives way to a clear mat, without earthiness.

Frosting small brasswork.—Fasten a circular scratch-brush, made of very fine brass wire, on the lathe, and having previously scoured the brass with strong pearlash ley, hold the work against the revolving brush, which must be driven at a good speed.

Curling flat surfaces.—Holtzapffel, senior, introduced this style of ornamenting flat metallic surfaces, and the following description of the *modus operandi* is given by his son:—"The work (after being held, scraped, and passed over with Water-of-Ayr stone) is cloaked with a piece of charcoal and water, by means of which the entire surface is covered with large curly marks, which form the ground. The curls resemble an irregular cycloid pattern, with loops of from $\frac{1}{2}$ in. to 1 in. in diameter, according to the magnitude of the work. Similar, but smaller, marks are then made with a piece of snakestone, bluestone, or even a common slate pencil, filed to a blunt point. The general effect of the work much depends on the entire surface being uniformly covered; with which view the curls should be first continued round the margin; the central parts are then regularly filled in; after which the work is ready to be varnished."

Lacquering.—Small circular work, after being well scoured, and burnished if necessary, is best lacquered in the lathe. The work should be slightly warmed over a clear charcoal fire, or in a stove, and the lacquer applied very thinly with a soft camel-hair brush. A charcoal brazier should be held under the work for a few seconds, after the application of the lacquer, to prevent chilling. To lacquer a flat surface, clean carefully by boiling in American potash and water. Dip in hydrochloric acid if it be desirable to heighten the colour of the brass; wash well, first in cold water, then in hot (removing any black muddiness with a fine brush), and dry in hot sawdust. When dry, burnish if required. Place upon a flat iron plate, just lukewarm. Pass the lacquer quickly but evenly over the surface by means of a rather large but fine camel-hair brush. Be careful not to pass twice over the same spot, or a ridge is almost sure to appear. Warm the lower plate until the work is quite dry.

Correspondence.

THE BELGIAN PHOTOGRAPHIC EXHIBITION.

Sir,—In your impression of the 19th February last you have been good enough to refer to the principal points

connected with the Photographic Exhibition to be held in Brussels in July next.

We have to thank you for this notice, and we sincerely hope that it will call attention to the matter in England, where photography has so many distinguished masters in all departments of the art.

There is, however, one observation that we desire to make. In the last paragraph of your article it is stated, "There will be no sale of the photographs exhibited." If the impression conveyed by this remark is that the exhibitors cannot sell their pictures, then it is erroneous, for all works exhibited may be sold. We shall, indeed, exert ourselves to the utmost to dispose of the articles on the most eligible terms, and to this end we have desired exhibitors to mention the price at which the pictures may be sold. (See Art. 8 of the Prospectus). The price must not, however, be set upon the pictures themselves, and this is the only restriction imposed upon exhibitors.

May we venture to hope, in the interest of our future exhibition, that you will be good enough to make the little correction we have indicated in the next impression of your journal?

With the assurance of our profound respect,

The President—DE VYLDER.

The Secretary—LEONCE ROMMELAERE.

The Belgian Photographic Association,

44, Rue de Namur, Brussels, 17th March, 1875.

PICTURES FOR THE MAGIC LANTERN.

DEAR SIR,—Since writing my last contribution I have read with much pleasure the interesting account by Mr. Biggs of the various photographic operations by means of which a picture can be produced for the purposes of the magic lantern, but I fear he is too sanguine in supposing that to obtain an outline is an easy matter, unless he infers that no one would attempt in any way to produce a picture for the lantern unless he possessed some general artistic knowledge, both as a draughtsman and a colourist. That this must be the case is evident, as gouty and feeble lines, when so highly magnified as they appear on the screen, would (especially in architectural subjects, the rigging of vessels, &c.) become so obvious as to spoil the whole effect, however well the picture may have been coloured. As a knowledge of the various means of obtaining an outline, either of the same or of a reduced size, from a copy may be serviceable to your readers, not only for the production of lantern pictures, but also for various other purposes, I will, with your leave, offer them some information as to the various means of producing it. The advent of photography has rendered the use of some mechanical contrivances for this purpose obsolete, such as the camera-lucida. The pentagraph is still, no doubt, useful, especially to architects, but its cost would prevent its being used by any other than professional men. Reticulation, or the method of producing an enlarged or diminished copy of an outline from the original, is frequently used by artists to place a design of a picture upon canvas after having first produced it as a drawing on a smaller scale; but as this requires some knowledge of geometrical proportion and correct drawing, it would prove too difficult for general use. The camera-obscura as originally constructed, and as may be now obtained at toy warehouses, offers a simple and effective means of obtaining a reduced copy of anything. The ground glass or diaphragm should be so arranged as to allow of its being removed, and thus, after the outline is made upon it by means of a blacklead pencil, it may be treated as a photographic transparency, and copied of any required size by means of photography. Although a back of this description might be added to a photographic camera, yet this would not be desirable, as the whole thing complete can be purchased at a less expense as a toy, than its materials only would cost separately. It might be as well, perhaps, to use a better lens than those generally sold

with it. Then, again, it is necessary to say that the drawing of the tracing should be made with a firm and free hand. The draughtsman should understand what constitutes an outline, otherwise his labour may be greatly increased to no purpose. The most simple—and, I believe, the most effectual—means of obtaining an outline from a copy by a beginner is to make one of the same size as the original upon tracing paper, which is sold ready prepared for this purpose, or may be made by saturating tissue paper with any thin varnish, and by various other means. Should the subject be not too large, a plate of ground glass would be the most preferable, as the outline on this could be at once reduced by photography to any size required. If the drawing be made with what is termed copying ink, a piece of damp paper placed over it, over which should also be placed a piece of cloth or flannel, a roller now being passed over the whole, taking care that the paper above has not been shifted, a correct reversed transcript of the drawing will be found upon it.—Yours truly, JAMES MARTIN.

5, Clarence Place, Ilfracombe, March 30th.

PS.—Can any of your correspondents inform me of any substance that will greatly increase in size when wetted?

Talk in the Studio.

FIRE AT MR. TENCH'S WAREHOUSE.—A fire broke out in the photographic warehouse of Mr. Tench, in Fleet Street, on the evening of Saturday last, and continued some time before it was discovered. The damage was very extensive, some portions of the instrumental outfit for the Arctic Expedition being destroyed. The cause is involved in mystery, as the premises had been closed two days at the time the fire was discovered. Fortunately the manufacturing department was not injured, nor any damage to prevent the ordinary transaction of business.

FORBIDDEN PORTRAITS.—It is stated in a daily contemporary that several prosecutions of Bonapartists for the unauthorised hawking of books and prints have recently taken place in France. In Paris a publisher has been fined 500 francs for circulating photographs of a Bonapartist agent. In the department of the Orne a curé has been fined fifty francs for distributing pamphlets and portraits of the Prince Imperial picking up bullets at Saarbrück; and an agent of the Bonapartist paper, the *Ordre*, has been fined 500 francs for distributing photographs from Chislehurst.

REDUCING INTENSITY OF NEGATIVES.—Mr. B. Benecke gives the following in our Philadelphia contemporary as a sure and reliable process to reduce the intensity in over-intense negatives without in the least destroying the faintest detail in the shadows:—"I always have been an advocate of intensifying, for the reason that there was no practical way known of reducing the intensity in the high-lights without injuring more or less the detail in the shadows, or risking the negative. I am now not more afraid to get a negative too intense than I was formerly to get it too weak. The enclosed two negatives were taken on one plate, both developed simultaneously, had the same intensity; then the plate was cut, and one half treated in the manner presently to be described. The object taken was a book resting on a green posing chair, and having a piece of black velvet by its side. The process is based upon the property of sulphide of silver, which combination is a very permanent or obstinate substance in regard to the action of nitric acid or cyanide of potassium, &c. Here it is. Take a very diluted solution of sulphuret of potassium, pour it over the fixed and washed negative; watch it from the glass side. The sulphuret will penetrate the thin deposit first, and the sulphide of silver, being of a darker colour than the reduced metallic silver, the negative will look somewhat like a positive from the glass side. Now wash and pour on a solution of mercury and iodide of potassium (my favourite intensifier), or mercury alone, or iodine and iodide of potassium. The negative will now be very intense, but never mind; dip it into your cyanide bath for thirty to sixty seconds, wash it, and examine it. Should it be not quite weak enough, or did you wish some parts of it particularly reduced—as, for instance, a white dress, &c.—you may treat it again with mercury, especially those parts

locally, you wish to weaken most, and then, of course, with cyanide again. Using a developer too warm has often been the cause to get too much intensity, and so I hit upon this plan, which I hope will prove a valuable addition to the knowledge of our practical photographers in 're photographica.' The thickest negative can thus be converted into a fast-printing solar negative. No patent on it!"

CONVERSION OF LITHOGRAPHIC INTO LETTERPRESS PLATES.—A perfectly smooth and polished zinc plate is first coated with weak phosphoric acid, then well wiped off, quickly placed over an alcohol flame, and rubbed dry with a woollen cloth. An impression on paper from the lithographic original in a moist condition is placed upon the zinc, and passed through the press several times. It is then treated as an ordinary lithographic stone, except that varnish is employed instead of oil of turpentine. The plate is next wiped off and dried, and the drawing dusted with finely powdered colophony, every particle of the latter being carefully removed from the free portions of the plate. It is then very cautiously heated to the fusion of colophony, and graphite dusted upon the plate and rubbed until the drawing acquires a decided lustre. The plate is then placed in a half-saturated solution of sulphate of copper until a black deposit forms upon it, after which it is removed, wiped off, and replaced in the copper solution, the operation being repeated two or three times, when the drawing appears in decided relief. The free portions of the plate are then coated with a mixture of gum-arabic, ochre, whitelead, &c., but not higher than the relief of the drawing, and when dry, the whole is rolled with transfer ink. The drawing may be further strengthened by removing the layer of gum, immersing it in water, and treating it again with sulphate of copper, until the broad spaces are deep enough to allow it to be used in the letterpress.—*English Mechanic.*

NEGATIVE VARNISH.—Mr. H. L. Bingham gives the following in the *Western Photographic News*:—"Select four ounces of bright, clear orange shellac, rejecting any having black scales. Dissolve the shellac in twenty ounces of alcohol, and filter. To expedite the preparation grind the dry shellac fine, in a mortar, then add to alcohol, and shake thoroughly, placing the bottle in a water bath, and agitating it frequently. The shellac will soon dissolve. When cold, filter. Having powdered two ounces picked gum sandrac, add the same, and dissolve by aid of water bath as before. After filtering it is ready for use."

To Correspondents.

JOS. HOLT.—We have very often described the process of fuming sensitive paper, and can only briefly indicate the method here. Take a good sized box—any kind of packing case will serve—line it with paper to make it air-tight, and see that the lid fits well. Now place a saucer at the bottom with (say) an ounce of liquid ammonia at the bottom. Pin a sheet of sensitive paper with its back to the lid, close the box, and allow the surface of the paper to receive the fumes of the ammonia for ten or fifteen minutes. It is then ready for the printing frame.

A YOUNG PHOTOGRAPHER.—It is possible to produce enlargements with a magic lantern and paraffine lamp. A correspondent wrote some time ago describing his success. He said:—"Very good transparency enlargements in the Saronytype style can be produced with paraffine and a good lantern. Those who wish to try this method of enlarging will find they can produce a three and a half or four inch vignette head on a ten by twelve wet collodion plate, with iron development, with an exposure of seven or eight minutes. Pyrogallie development may be used, but the exposure may be calculated at about four times as long. My lantern is fitted with a three and a-half condenser, used in connection with a quarter-plate lens. The lamp I use is known as a passage lamp, having a wick seven-eighths of an inch broad. There are only two points to be attended to in the use of a lamp of this description: first, the body holding the oil must be kept cool; secondly, the flame must be turned edge on, or nearly so, to the condenser, as the illumination is much better in this position."

AROS.—Signor Borlinetto does not state why he uses rock salt. It is probable that common salt will answer. 2. We do not know where the gelatine rollers may be procured. 3. Sulphate of baryta is insoluble in water, but on being shaken up with the bath acts somewhat like kaolin in carrying down with it other matters which were in solution. Nitrate of baryta is soluble, and remains in solution in the bath. 4. Our correspondent should refer definitely to the communication to which he alludes as "Borlinetto's last," as we are otherwise left in uncertainty as to his precise meaning.

S. S. YOUNG.—Sulphate of copper is meant, we believe, in the American recipe to which you refer.

J. A. MILES.—The transaction you describe seems to be a piece of bad business management; but you will see, on second thoughts, that the good or bad business practice of any individual tradesman is not a matter for comment in our pages merely because his advertisement appears in our business columns.

IGNORANCE.—There are a good many useful instruction books containing more or less of the kind of information you want, but none which will suit you better than that of Captain Abney. Its especial characteristic is, that it explains the theory of the operations as well as supplying practical instructions and formulæ.

GUNNER.—Dark tents and developing boxes are so numerous and varied that it would be impossible to recommend one without knowing the special class of work, size of plate, &c., you require it for, and whether you require it to be sufficiently light and portable for one person's portage, or to be carried by assistants. In any case we could not with propriety recommend any especial make by name in this column. You will find several described in the advertising pages of our YEAR-BOOK. Consult these, and if you wish for further advice, mention those which seem suited to your purpose, each in connection with a letter or figure, to which we can refer in giving you further hints.

B. A. J.—We cannot with certainty indicate the cause of the minute spots on your prints merely from seeing them. A searching examination into the history of all the operations and all the materials employed may be necessary to determine the cause. They have very much the appearance of the spots produced by bronze powder used in "gold" printing. But you say you do not use mounts so printed. Have you any such in the drawers? We have heard of cases where the defect has arisen from such powder adhering to cards which had merely been in company with cards so printed. We see no reason why the gutta-percha dish used for the fixing bath should affect the matter. We should prefer to avoid the all night soaking; it is often injurious. It is possible that the defect may be due to impurities in the mounting boards. Hypo dust, sulphur from the burning of coke fires, and similar causes, will produce such results. A thick varnish of almost any kind will protect wooden vessels to hold the fixing bath. A varnish of equal parts of collodion and boiled oil will answer. A good coating of shellac varnish will answer. The latter will be better for the addition of sufficient castor oil or linseed oil to give toughness.

A PHOTO. ASSISTANT.—The markings on your negative arise from irregular flowing of the developer. It is probable your bath has an accumulation of ether in it, which prevents the developer flowing freely and mingling with the solution on the plate. Or it may be due to the use of a horny, repellent collodion. The common remedy is the addition of alcohol to the developer. More skill in manipulating will help you. The addition of sugar or glycerine to the developer, according to formulæ we have often given, will help you. We presume that when arrangements are complete for selling Mr. Tilley's method of printing in background effects, &c., the fact will be duly announced. At present we do not know anything more as to arrangements than we have announced.

GELATINO-BROMIDE.—We do not know the address of the gentleman you mention.

C. WARMAN.—The letter has been forwarded.

PHOTOGRAPHS REGISTERED.

Messrs. SAWYER & BIRD, Great Yarmouth,
Photograph of Drawing of Primitive Methodist Temple, Great Yarmouth.

Mr. T. WINTER, Waterford,
Three Photographs of Rev. T. N. Barker.

Messrs. BLOOMFIELD & Co., Hastings,
Photograph of Rev. A. Hall.
Photograph of Rev. T. Vores.
Photograph of late Benjamin Attwood.

Mr. A. McLEOD, Birmingham,
Photograph of Mr. Sankey.
Photograph of Mr. Moody.

Mr. L. BERTIN, Brighton,
Three Photographs of Mr. J. Levy.
Two Photographs of Miss Rose Coghlan.
Five Photographs of Madame Lemmens Sherrington.

Mr. G. NISBET, Bournemouth,
Photograph of a child kneeling in prayer.

Mr. O. J. SHAW, Watford,
Photograph of Apsley End Church.
Two Photographs of Rev. D. Inglis.

Mr. PIERCE, Belfast,
Photograph of "Honeymoon," winner of the Waterloo Cup, 1875.

Mr. ADAM JOHN COOKE, Thurles, Ireland,
Two Photographs of the late Bishop Leahy, of Cashel, lying in state.

Photograph of Funeral Procession of Bishop Leahy.

Mr. J. MATHER, Great Bolton,
Photograph of Rev. Canon Mather.

Mrs. PLUMTREE, South Lincoln,
Photograph of Peter Blanchard

The Photographic News, April 9, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

DULL WEATHER—HEALTH OF THE TRANSIT OF VENUS OBSERVERS—THE INFLUENCE OF COLOURED LIGHT ON VEGETATION.

Dull Weather.—From all sides come complaints of dull weather. In November we expect little else, and, indeed, until January is pretty well gone, we do not look for much light during the twenty-four hours; but this year even bright frosty days have been extremely rare, and the sun has never thoroughly recovered the Transit of Venus. And not only in this country, but from the Continent, complaints reach us of the extraordinary dullness that has prevailed, and we all find ourselves looking for the warm summer time with the same longing almost as frozen-up Arctic explorers. What between the murky skies and east winds, we have been sorely tried during the present year, and never will green buds and April showers be more welcome than at present. No reliance whatever could be placed on the weather we have been afflicted with for the past six weeks. There was no knowing whether you could use up the batch of paper you had prepared, or not; and many an afternoon's work has been cut short by the heavy leaden skies that have been oppressing us. The days of sunshine, so precious to photographers at this time of the year, since midwinter might be reckoned up on one's fingers, and then the heavy clouds only separated for a time, and soon became a dense mass again, through which no sunbeam could pass. It was little use withdrawing your blinds and taking out your stops, for a brilliant well-lighted picture was simply out of the question. What an unfortunate thing it is that one cannot bottle tropical sunshine, and import it like Apollinaris water, or other foreign produce! We should have plenty of trade for the West Coast of Africa then, and nobody would object to pay a heavy duty. We believe it has been tried once, and Dean Swift has given an account of the experiment somewhere, but we suppose the secret has since been lost. It is some consolation for us to know meanwhile that we in this country are not the only people who have suffered from the freaks of the sun, but that our French and German neighbours have had also reason to complain, for, as we were recently told by a German correspondent, the Fatherland had been favoured this year with a total eclipse of the sun of some months' duration.

The Health of the Transit of Venus Observers.—The Transit of Venus observers, unfortunately, have not escaped the vicissitudes of travel and climate in the performance of their duties, and it is not until the end of this month that the last of the scientific staffs will find themselves home again. Captain Abney did not get back soon enough to escape a slight touch of fever, while some of the New Zealand and Kerguelen's Land observing parties suffered a good deal from climatic influences. Lord Lindsay, who went to the Mauritius, might have been home a couple of months ago, but an attack of fever has so wasted his already somewhat gaunt frame, that he was ordered to remain in Italy until the Spring. He had anticipated being back in London soon after the opening of Parliament, for his lordship is one of the representatives of Wigan, but this was found to be simply impossible, especially with such rigorous weather as we have lately experienced. The Kerguelen's parties, who certainly had the most trying journey of all to undergo, will have been absent from this country ten months, so that the imperfect little photographs that have been secured, and astronomical observations that have been made, have proved very costly matters. It is a subject, however, of sincere congratulation that all the stations have been tolerably successful, and that we have not to lament any serious accident, or death, among the many scientific men who volunteered on so perilous an enterprise.

The Influence of Coloured Light on Vegetation.—An Italian

chemist, M. Macagno, has, we see, made some interesting experiments upon the influence of different coloured light upon vegetation. The plants he practised upon were French beans, which were sown in boxes and allowed to grow, some under the influence of ordinary light, and some under red light, violet light, and yellow light, the plants in the three latter cases being covered with glass of the respective colours. The seeds were sown on the 30th July, and the experiments terminated on the 24th August, taking place, therefore, in a summer temperature. It appears that of the seed sown, the last to germinate, and the first to die, was that under red glass; in the case of the plants both under the red and yellow glass, they had so changed that it was with difficulty only that they could be recognized at all as bean plants. The plant grown under white glass was far more perfect than that under violet glass, and was, indeed, the only one that came to perfection. M. Macagno examined the plants chemically, and found that the most organic matter, and also the most ash, was given by the bean grown in white light, and from this he concludes that *all the elements of white light*, and not only the actinic rays, have to do with the growth of vegetation.

ON THE EMPLOYMENT OF CHROMIUM SALTS AND PERMANGANATE OF POTASH IN PHOTOGRAPHY.

BY M. CHARDON.*

I HAVE thought it would be interesting to the Society to make known the results of some new experiments which I have recently made, and which, if they have not much practical bearing at present, are not without some value, and may possibly find application at some future time. The action of permanganate of potash being well defined, and conforming to theory on every point, it was easy to make experiments with bodies of a similar character. We know that if the action of gelatine upon chromic acid is prolonged for some instants, the latter is decomposed, and oxide of chromium is formed. This oxide plays in intensifying the same role as oxide of magnesia, but it has a less free action, and is therefore of less practical value. Nevertheless, oxide of chromium being a little more soluble than oxide of manganese, it may be replaced by chloride of gold, and consequently form a toning which softens down a hard image.

On repeating these experiments, and employing as organic matter a film of bichromated albumen, I was enabled to confirm an assertion which has already been made, viz., that, under certain conditions, over-exposure reverses the ordinary result. Thus, having exposed to light two plates under a negative, the one for ten minutes, and the other for three-quarters of an hour, the first I found developed with regularity, and, after being intensified with permanganate of potash, yielded a positive; the second, on the other hand, developed and intensified under the same conditions, gave a negative.

Both plates, it must be remembered, were prepared without admixture of colouring matter. At first sight this fact appears strange, but it is easily explained. The over-exposure in the case of the second plate completely decomposed the albumen where the light had acted strongly—that is to say, in the transparent portions of the negative—so that the organic matter, being, so to speak, absorbed, was incapable of acting upon the permanganate of potash; whereas in the less transparent parts of the negative, the albumen, not being altogether decomposed, had been capable of precipitating the permanganate in proportion to the tints of the cliché. For this reason a negative is produced by means of a negative.

This experiment has no practical value—for it is easily intelligible that such a negative must always be of an imperfect nature—but nevertheless demonstrates what value

permanganate of potash may be in photography. In a process based upon its use to which I recently called attention, I proposed to employ it for intensifying carbon transparencies on glass, so that they might be used as negatives; and one of my colleagues has now claimed the honour of having discovered and patented this circumstance as far back as last October. Without in any way questioning the value of this patent, such a subject being out of the province of this Society, I will discuss from a theoretical view the formula given in this communication. The patent is thus worded:—

"The gradual intensifying action which I apply to the chromium salts is a solution of 300 cubic centimetres of water, 1 drop of ammonia, 1 gramme of ordinary sugar, and further, according to the vigour of the cliché desired, a few drops of a saturated solution of permanganate of potash. The cliché is put into a bath containing this solution, and then, if one desires more intensity, the liquid is strengthened with a little more of the permanganate solution. The cliché thus intensified gives a print of the same depth as the original. I claim, therefore, this mode of intensifying clichés obtained by means of chromium salts, &c.

The patentee has given little attention to the theory of the matter, for he intensifies by means of chromium salts, and these salts are without action upon permanganate of potash. He forgets one point which is to make clear the question, for he does not indicate that the reaction operates upon organic matters, such as gelatine, gum, sugar, albumen, mucilage, linseed, and other bodies that might be utilised in photography. But let us pass to the solution: water 300 cubic centimetres; one drop of ammonia, which is absolutely useless unless it is to soften the organic matter, of which no mention is made; sugar one gramme. Here, theory seems to me at fault. Either the sugar is in too small a proportion in the solution, and then it is valueless; or, if its proportion is large, it is injurious, for in that case it reduces the permanganate without aiding the intensifying action, the latter not taking place, it must be remembered, in the same way as if salts of silver were employed. In the latter case the intensifying solution is generally composed of pyrogallie acid, nitrate of silver, and acetic acid, to retard the formation of gallate of silver. It acts by a decomposition of the solution to the advantage of the image, a proportional deposit being formed.

Intensifying by means of permanganate of potash takes place in a different way. It is decomposed only in such places where it is in contact with organic matter, and the proof of this is that the permanganate which is not decomposed leaves a solution perfectly limpid, which may be employed in a subsequent operation. It is necessary, therefore, to suppress in the solution all organic matter which will be liable to decompose without advantage to the image.

In suggesting the employment of pure and simple permanganate of potash, I have said that with gelatine alone perfect images may be obtained; I may add that this is the case with all organic matter susceptible of being spread in uniform films.

If I only knew the process which has been taken as the basis of the patent of my honourable colleague, I should be in a position to reply to the observations he has made in his usual courteous manner. I may add, in conclusion, that I had no pretence to the invention of permanganate of potash, nor to its applications, but I cannot accord this honour to the owner of the invention patented in October 1874; for already in 1868 I find in the *Bulletin* a communication by Mr. Wharton Simpson, who, in some highly interesting and perfectly original researches, indicated an application of this product which he used for the purpose of intensifying clichés produced by means of silver salts. Furthermore, in a communication made by Mr. Swan, in 1872, which is now before me, I find that gentleman, whose works upon carbon printing are well known, has indicated the employment of permanganate of potash for the progressive intensifying of carbon impressions. He indicates the care which

it is necessary to employ in making use of the process, the reaction produced, and the formation in the film of gelatine of sesquioxide of manganese. He gives details relative to transparent positives, as also to colouring by the action of permanganate of potash; he omits none of the practical details, and supports everything upon his theory. These facts I leave for the consideration of all.

THE PRACTICAL PRINTER IN AMERICA.

XXI.*

"CITRIC ACID TONING BATH.

"THIS is a most excellent bath, either for portraits or landscapes, there being in its composition no strong alkalis or acids that will be apt to hurt the albumen on the prints a particle. We used this bath two years, and it is a most worthy one. Here it is:

Solution No. 1.

Citric acid...	...	...	1 ounce
Water	...	...	20 ounces

Solution No. 2.

Chloride of gold ...	...	...	15 grains
Water	...	...	15 ounces

Stock Solution.

Now take of Solution No. 1, 2½ ounces; make slightly alkaline with saturated solution of bicarbonate of soda 2½ ounces, or about that. Solution No. 2, ½ ounce; water, 64 ounces.

"When ready to tone, take sufficient of the 'stock solution' (which should never be less than three or four days old) and add thereto one ounce of gold solution No. 2, and make this fresh solution which you are about to add to the bath a little alkaline with bicarbonate of soda.

"A better way, however, for the beginner to add this fresh gold to the bath, instead of pouring the gold immediately into the bath, is to pour it first into a clean graduate, and there make it alkaline. Pour some of the toning solution (stock) into the graduate, and thoroughly stir with a glass rod, and then add the whole to the rest of the bath which is in the dish, and stir well again. To every four sheets of paper you tone, add about an ounce of gold solution; adding, however, at different stages of the toning operations, and not all at one time, as that would make the first few batches of prints tone too rapidly. Do not add any gold while there are any prints in the bath, and stir well, and allow the bath to stand without being used for about three or four minutes after you add the gold. I recommend the above cure to beginners, because they often obtain uneven tones by the abuse of the advice given above.

"Do not tone in a too strong light, but in rather a weak one, and judge not the tones of the prints while in the hand, but while lying down in the dish.

"Tone exactly as you wish them when dried, and no more nor less. Wash the prints constantly in running water after toning. Fix as usual.

"BICARBONATE OF SODA BATH.

"This is probably one of the best of baths, and I have seen some of the very best of tones obtained with it.

"It is argued by some that the simpler a bath is the better, and that it is only chloride of gold in the toning bath that tones, and that all other ingredients that are placed in the bath are useless; and this bath is just what these photographers advise, since there is nothing else to be placed in it. Here it is:—

Chloride of gold solution (one grain to the ounce of water)	...	...	1 ounce
Water	...	...	16 ounces
Bicarbonate of soda (saturated solution)...	...	...	10 minims

Make half an hour before use, so as to allow it to ripen.

thoroughly. Make of lukewarm water. This bath cannot be kept, and needs to be made up fresh every time you prepare to tone. Throw down the gold in the old bath with protosulphite of iron. It is ready for toning when it has commenced to *discolour slightly*.

"I have one more bath to give, and then I am done, and I have reserved this one for the last, not because I think it is the least important, but because I think it the best of the whole lot, for I do not think that there is a bath besides this one that works so prettily during toning, and which gives such magnificent tones. It has the following merits:—1st. It is simple in construction, and not apt to be changeable. 2nd. The most beautiful tones can be obtained with it. 3rd. The alkali used in it is not used in such abundance as to hurt the albumen a particle. 4th. It will tone a weak and flat print the best of any bath that I have ever used. The most beautiful tones are attainable with it, the high-lights and half-tints of the face being very clear, and cool in the more retiring shades, while in the hair, deep shadows, and draperies, especially the darkest, there will be a very rich, warm colour. There is always a very delicate velvety look to the prints when properly toned, which is always very much admired, being very difficult to obtain with some baths. It is made as follows:—

Chloride of gold	...	...	2 grains
Pure rain-water...	...	...	24 ounces.

Make the solution slightly alkaline with
Saturated solution sal soda, about 6 to 8 minims
Chloride of sodium (table salt),
in weight ½ to 1 ounce.

"In making this bath, I first place the quantity of gold solution I am going to use in the dish at one corner, and in it place a piece of blue litmus-paper, which will immediately turn red. Now take the bottle of sal soda, and drop into the solution in the dish until the litmus-paper turns a decided blue, which will take about six or eight drops. Then place your water in the dish, and last of all your salt. Stir up the contents well, and let stand from five to ten minutes, and it is ready for use. The bath should be made up as per formula every night, throwing down the gold in the old solution with protosulphate of iron.

"In toning with this, or, in fact, with any of the above baths, should it become exhausted, then add the ingredients used in the first place in exactly the same proportion as was used in the making of it at first.

"One of the greatest mistakes that is made in toning by some toners is in toning the prints until the draperies, &c., are about the right shade, thus disregarding the face, which is the principal attraction of the prints, and to the toner it should always be the object of attention. With the toning-bath just described, I will here give the mode of working, which, if followed out, will be productive of excellent results.

"This toning should be done in a quite weak and even light, and at a little distance from the window. An idea of the quantity of light required may be had by bearing in mind that all you wish is to see distinctly and clearly, without any guessing.

"Take a couple dozen of prints, and let them lie in your bath solution face up, but constantly under the surface, and keep them in motion while in it. At first the prints will not perceptibly change, but within the course of two minutes or so the high-lights and half-tints of the face will lose their red tint, and will commence to border on the rich purple, and then they will very quickly arrive at that stage when they are to be removed to a bath of running water.

"This stage at which the toning is to be discontinued is perhaps at first a little difficult to determine, and you should tone a batch and let your assistant fix them, and when they are fixed, not before, you should judge of the tone. Never take your prints up in your hands to

examine them, for you will surely then be deceived, and take them to be undertoned, when by examining them while lying in the dish they will appear to be toned plenty.

"The prints are toned when the high-lights and half-tints of the face appear clear and a little blue when they are lying down in the dish and examined in a weak light. Take them out immediately, even if upon looking at them in a stronger light the shadows and draperies should appear as red as fire, for the prints are toned. In nine cases out of ten you will at first overtone the prints rather than undertone them. Tone for the lights and half-tints, and let the shadows take care of themselves.

"The salt in the above bath is the improvement of this bath over the common sal soda bath, and it is partly owing to this salt that such beautiful tones can be obtained. In case you overtone, the tone will never be a disagreeable slaty one, but rather a pretty blue."

THE SULPHUR FLAME AND OTHER LIGHTS SUITABLE FOR PHOTOGRAPHY.

BY MM. A. RICHE ET C. BARDY.*

MM. DELACHANAL ET MERMET have published a very interesting note, in which they give a description of the bisulphide of carbon and binoxide of nitrogen lamp, which produces in a continuous manner a very photogenic light, such as till now has been obtained but in an intermittent manner, and for a few instants only. The apparatus consists essentially of a glass flask containing bisulphide of carbon into which is directed a current of binoxide of nitrogen, and of a metal tube filled with iron filings to prevent explosions, at the extremity of which the mixture is inflamed.

This question of artificial illumination is one of much interest, because the production of photographic enlargements is often conducted by means of artificial lights; moreover, it is by their aid that night scenes are reproduced, and dark localities are illuminated. In countries, too, where sunshine is more rare than in ours, the use of artificial light is a matter of greater importance, and no wonder the English journals have interested themselves in the matter, and special mention has been made of the dangers of explosions, which such an apparatus as that just described may be liable to.

These considerations, which have also struck us, have led us to examine the subject once again, and to seek means of guarding against dangers that may arise, either by modifying the method of operating, or by suppressing the employment of the bisulphide of carbon altogether; we also determined to examine and compare the nature of various flames which are capable of impressing the salts of silver.

1.—We started with the natural idea that the flame of bisulphide of carbon and binoxide does not owe its photogenic power to the carbon, that burns with a yellowish white flame, but to the sulphur, the light of which is of a very pure blue. To realise this idea we fused some sulphur in an earthen vessel, five centimetres in diameter, and, when liquid, we directed by means of a tapering tube, placed as vertical as possible, a jet of oxygen coming from a gasometer. In this way we produced a continuous blue flame, which quickly impressed bromide of silver, as will be seen in the table of results given below.

If nitrate of potash is heated in the same manner to a temperature at which it begins to decompose, and fragments of sulphur are thrown into it, the light is very bright, but white, and endowed with less photogenic activity than the preceding light.

2.—We substituted in the second experiment bisulphide of carbon for the sulphur, directing the jet of oxygen upon the sulphur alight in the vessel. This liquid burnt

without explosion, with a blue light, similar to the preceding one.

3.—We replaced, in a third experiment, the oxygen by binoxide of nitrogen, the operation being conducted as in the former experiments. The gas was in the same gasometer which previously contained the oxygen, and the table and vessel were the same. The light appeared similar to the previous ones, but, as will be seen further on, its photogenic power was less.

It is evident that no explosion need be feared when the bisulphide of carbon is operated with in this manner, because the reacting bodies are not enclosed in an apparatus, and the jet of oxygen, or binoxide of nitrogen, acts upon the sulphur on the surface of a bath largely mixed with air.

The importance of substituting oxygen for binoxide of nitrogen is at once apparent, whether regarded, on the one hand, because the gas is more easy to prepare and more economical, or, on the other, because it does not give off any fumes dangerous to breathe.

4.—We next proposed the comparison as closely as possible of the foregoing lights obtained without risk of explosion, with a light given by means of a current of oxygen or binoxide of nitrogen upon bisulphide of carbon enclosed in a flask.

The gas, after having traversed a bottle filled with pumice stone impregnated with bisulphide of carbon, was passed through a long tube of glass containing iron filings, and was then illuminated at the extremity of a metal tube of a larger calibre than that used in the preceding experiment, through which the oxygen or binoxide was generated. With the oxygen we took the precaution of surrounding the flask and the tube with carpet, a precaution which was not altogether futile, for as soon as fire was approached, the flame went back into the apparatus, which burst, and the bisulphide of carbon took fire.

The experiment succeeded perfectly with the binoxide of nitrogen and the bisulphide of carbon, and the bromide of silver was vividly impressed, but with an intensity less great than was the case with the combustion of sulphur in oxygen. At the same time, we may remark that this experiment cannot be compared to the preceding ones, in the same way as these may be likened to one another, because the form of the flames is different, and the gaseous mixture has been checked by the iron filings and pumice stone, an effect that we have desired to counterbalance by augmenting the calibre of the delivery tube.

Finally, we have compared the sulphur and bisulphide of carbon flames, to the oxyhydrogen light obtained by carburating ordinary coal gas with petroleum spirit, with the Drummond light, the magnesium, and that given by zinc strongly heated in a jet of oxygen. To appreciate the chemical activity of these lights we exposed to their action, under identical conditions, some sensitive dry plates produced by the excellent method of M. Stebbing, who was good enough to prepare for us a large plate, which was cut into strips two centimetres broad by ten long. The experiments, of which the results are given in the table below, were all made the same evening. The sensitive plates were fifty centimetres from the source of light, and the exposure lasted sixty seconds, the time being measured by means of a chronometer. The sensitive plates were enclosed in a frame under a screen formed of ten sheets of waxed paper superposed, two centimetres broad, and of variable length. One measured ten centimetres, and consequently covered exactly the whole of the sensitive plate; the second measured nine, the third eight, and so on, so that the last sheet was but a centimetre long. These sheets were pressed between a layer of glass on one side, and a layer of horn on the other, and there were figures from one to ten at equal distances, so placed that No. 1 corresponded to one sheet, and No. 10 to the ten sheets superposed. In this way a screen was obtained the opacity of which was proportional to the number of sheets

superposed, and which were indicated by numbers. If, for instance, it was seen that after an experiment the figures 1 and 2 were printed, and in another 1, 2, 3, 4, 5, it was obvious that the photogenic power of the second light was to the first as 5 is to 2. All the plates were developed together, and every experiment was repeated. The following table enumerates the principal results obtained:—

Nature of the light.	Figures visible.	
	Exp. No. 1.	No. 2.
Oxyhydrogen light	1	1
Drummond light... ..	3	3
Zinc burnt in oxygen	3	4
Magnesium lamp... ..	5	5
Current of binoxide of nitrogen in a flask containing bisulphide of carbon	6	6
Jet of binoxide of nitrogen upon a vessel containing bisulphide of carbon ...	6	7
Jet of oxygen upon a vessel containing bisulphide of carbon	7	7
Jet of oxygen upon a vessel containing sulphur	8	8

It is therefore the light obtained by the action of oxygen upon sulphur which appeared to be endowed with the greatest amount of chemical activity upon bromide of silver, and we do not hesitate to recommend a practical trial of this illuminating method. There is no danger of explosion to be feared. It is, moreover, far from costly, for the only things wanted are a saucer or crucible for the sulphur, and a bag of oxygen, a gas that anybody can make for himself, or can purchase if he prefers it.

By replacing the earthen crucible by a vase of an elongated shape, into which are directed five jets of oxygen, we obtained, as may be imagined, a much more active light, which, on an exposure of thirty seconds, rendered the figure 9 apparent on the sensitive plate.

By replacing oxygen by atmospheric air under great pressure, a blue and faintly luminous flame was obtained, possessing but very little photogenic power.

A mixture of oxygen and air gives a light whose action upon salts of silver is in direct proportion to the amount of oxygen it contains.

Finally, by substituting the protoxide of nitrogen for the oxygen, we obtained a very beautiful blue flame, whose photogenic power is about one-fifth less strong than that of the flame produced by a current of oxygen when operating under the same conditions.

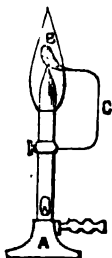
Protoxide of nitrogen may be prepared with the utmost facility by means of nitrate of ammonia, and it keeps without change in india-rubber bags; we think that it may be substituted with advantage for oxygen, the price of which, if obtained by means of chlorate of potash, is much higher.

The process has a drawback in common with all the bisulphide of carbon methods, viz., the suffocating smell of the sulphurous gas that is formed. This inconvenience is easily remedied in a laboratory where a cupboard or chimney can be made use of, or may be put up with in a spacious apartment, but in a small room the matter becomes serious. It may be obviated by placing a funnel above the vase communicating with the chimney by means of a tube, a current through which is established by means of a gas flame, or better still by placing the whole apparatus in a glass cupboard communicating with a chimney.

In a studio the extremity of the funnel may be put in communication with an aspirator, forcing the products of combustion to pass through a series of Woolf bottles containing an alkaline solution, which effectively absorbs the sulphurous acid.

The apparatus we have described is only a rough one, for we have confined ourselves merely to the production of a flame endowed with great photogenic power, and perfectly free from danger, leaving to each experimenter the question of constructing his apparatus in the most appropriate manner.

In conclusion, we beg to call attention to another light whose employment we believe would be of great service under many circumstances. Everybody uses in their dark rooms yellow glass and yellow light, which is unfortunately not always free from action upon silver salts. By replacing the light obtained by the aid of this glass with the monochromatic sodium flame, one may operate without the risk of fogging the most sensitive compounds. This circumstance we have proved by placing a bromide of silver plate, half covered with an opaque shield, at a distance of ten centimetres only from the flame, and holding it in this position for five minutes. After development both halves of the plate were precisely the same, and no trace of fog was perceptible upon the half that had been exposed.



A. Bunsen burner.
B. Wick of platinum thread.
C. Platinum wire supporting wick

This sodium light may be obtained by burning ordinary gas in a Bunsen jet. The Bunsen burner employed in all laboratories is constructed in such a way that the gas, mixed with air in suitable proportions, burns with a scarcely visible blue flame, which is, however, very hot. Two-thirds up this flame is introduced a little wick formed with platinum gauze, and containing a grain of marine salt, fused, about the size of a pea. The flame instantly assumes a yellowish tint, becomes very brilliant, and continues so as long as there is any salt left on the little wick. The only precaution to be taken is to place from time to time a little fragment of salt upon the gauze whenever the flame grows less brilliant.

TOUGHENED GLASS.

THE following interesting details in relation to the production of a glass much less fragile than that in use, to the discovery of which we recently referred, appear in the *Times*, and will doubtless interest our readers:—

Although the manufacture of glass has been carried on for about two thousand years, it does not appear that any attempts to overcome its inherent brittleness and liability to fracture, and at the same time to preserve its transparency, have proved successful—if, indeed, they have ever been made, which is doubtful. It is true that the French philosopher Reaumur many years since hardened glass somewhat by exposing it to a high temperature for a considerable time. But this process, which is technically termed devitrification, while it hardens, at the same time crystallizes, the glass and renders it opaque, the product being known as Reaumur's porcelain. Seven years since, however, M. Francois de la Bastie, a French engineer, after long and patient investigation into the subject, discovered a simple means of rendering glass practically unbreakable, and at the same time of preserving its transparency. There were many delicate conditions involved in the process by which he obtained this result, his success being achieved much in the same way as was Pallissy's, but on endeavouring to repeat the successful experiment he failed signally. For two years more M. de la Bastie, who possesses ample means, strove without avail to rediscover the secret of his success. At length, however, he succeeded in so doing, and has since been engaged in perfecting his invention, and in developing a laboratory experiment into practical working. The process of conversion in the main is a very simple one, so simple that it seems singular it was never thought of before. Broadly stated, it consists in heating the glass at a certain temperature, and plunging it while hot into a bath consisting of a heated oleaginous compound. There are, however, many conditions in connection with the details of the process upon which a satisfactory result depends, and the neglect of any, even in a slight degree, constitutes the difference between success and failure. Thus, the glass may be under-heated, and will not be susceptible to the effect of the bath, or it may be over-heated, and it will then lose its shape, or, again, it may be rightly heated and yet be spoilt in the course of transference to the bath. Moreover, the oleaginous constituents of the bath and their temperature have an important bearing upon the ultimate result. These and numerous other points of detail have all been satisfactorily settled by M. de la Bastie, who has designed furnaces and baths by means of which his toughening process can be carried out practically without fear of mishance. The time occupied in the actual process of tempering is merely nominal, for directly the articles are brought

to the required temperature they are plunged into the bath and instantly withdrawn. The cost of tempering, too, is stated to be very small.

We have observed that M. de la Bastie went through a long course of experimental research before he attained success. His first worked, as an engineer naturally would, upon mechanical principles. Knowing that the fragility of glass results from the weakness of the cohesion of its molecules, he not unreasonably expected that, by forcing those molecules more closely together, and thus rendering the mass more compact, the strength and solidity of the material would be increased. But this doctrine, which holds good with iron and steel, as Sir Joseph Whitworth has practically demonstrated, does not apply to glass; compression failing to toughen it, even if applied to it when in a fluid or soft condition. By applying heat, however, which is only force in another form, the desired end is attained, and the physical properties of the material become altered in a very remarkable manner. To this singular fact we can testify from the inspection of a number of toughened glass articles at the offices of Messrs. Abel Rey and Brothers, 29, Mining Lane, the representatives of M. de la Bastie in England. In these articles, which consisted of watch glasses, plates, dishes, and sheet glass, both coloured and plain, neither transparency nor colour is affected at all, and the ring or sound only slightly. These articles—some of them being exceedingly thin—were thrown indiscriminately across a room against a wall and fell spinning on the deal floor. Water was boiled in a saucer over a fire and the saucer was quickly removed to a comparatively cold place, and was unaffected by the sudden change of temperature. One corner of a piece of glass was held by the hand in a gas flame until the corner became exceedingly hot, but the heat was not communicated to the other portion of the glass, neither was it cracked from unequal expansion. A comparative experiment was then made with a piece of ordinary plate glass, and a similar piece of toughened glass, in order to show their respective powers of resistance to fracture, from the force of impact by a falling weight. In each case the glass was about six inches square, and was placed in a frame, the weight being dropped upon its centre. With the ordinary glass, a two-ounce brass weight falling on it from a height of twelve and eighteen inches respectively did no damage, but at twenty-four inches the glass was broken into several fragments. With a thinner piece of toughened glass no impression was made by the same weight falling from heights ranging from two to ten feet, the weight simply rebounding from off the glass. An eight-ounce iron weight tried at two and four feet respectively gave similar results. Upon the height being increased to six feet, however, the glass broke. But here another singular result was produced: instead of breaking into about a dozen pieces, as did the ordinary glass, it was literally smashed to atoms. The largest fragments measured about half an inch in length and breadth, and these were easily reduced by the fingers to atoms varying in size from that of a pin's point to that of a large pin's head. The lines of fractures in the fragments presented to the eye the appearance of irregular lace work, and these lines were, moreover, apparent to the touch, but more palpably so on one side of the glass than the other. Which of the two sides was the one that received the first impact of the blow we were not able to determine. Another peculiarity is, that the edges of the fractures are by no means so sharp, and therefore capable of causing incised wounds, as are those of ordinary glass. It would seem that the toughened glass possesses enormous cohesive power, but that if the equilibrium of the mass is disturbed at any one point the disturbance or disintegration instantly extends throughout the whole piece, the atoms no longer possessing the power of cohesion.

Of the practical nature of M. de la Bastie's unique discovery there can be no question whatever, nor can there be any doubt of its value in the arts, sciences, and manufactures. The applications which suggest themselves are innumerable, and above and beyond the usefulness of the process with regard to articles of domestic use come important considerations affecting the applied sciences, especially in connection with chymical manufactures and similar industries, where a material, alike uninfluenced by the action of heat or acids, has been so long and so vainly sought for—notably in connection with vitriol chambers in the manufacture of sulphuric acid, and for piping in chymical works. For the present there remains one purpose to which toughened glass cannot be so easily applied, and that is to window glazing in odd sizes, inasmuch as it cannot be cut by a diamond or other ordinary means. Our glaziers will therefore have a respite, but we cannot give them much hope that it will prove a long one, as experiments of considerable promise are being conducted with the view of solving this problem. Moreover, the glass can be cut to the proper sizes before toughening if desirable. The glass, however, is readily engraved either by fluorio acid in the usual way, or by Mr. Tilghman's elegant sand-blast process. It can be easily polished, and it can also be cut by the wheel, as for lustre work and the like. It only remains to congratulate M. de la Bastie on the useful and valuable discovery he has made, and to add that he is now erecting works in France to carry out in practice his ingenious process.

The Photographic News.

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THE NEW SIZE IN PORTRAITURE.

AN interesting illustration of the wide-spread feeling amongst professional portraitists that the introduction of a new size was desirable, not only for the purpose of giving a new stimulus to trade, but to fill an existing hiatus in the ordinary series of sizes adopted in photography, is found in the fact that a new size, in some respects analogous to that suggested by Mr. Blanchard, is receiving attention in the United States. In both cases a size somewhat larger than the cabinet, and of proportions analogous to those of the card portrait, have been adopted; but, amusingly enough, names not only different, but diametrically opposite, have been chosen. Mr. Blanchard, as our readers know, has chosen the term "Boudoir Portrait," as suitable to the new size and style; whilst our American friends have adopted the term "Promenade Portrait," as appropriate. The size and proportions of the Boudoir portrait, our readers know; the following are the dimensions of the "Promenade:" the mounting card is seven inches by four inches, the print is one inch and an eighth less than the card, leaving a white margin of one-sixteenth of an inch. The print itself, however, is surrounded by a fancy photographic border—of a marble pattern in the example before us—somewhat less than half-an-inch broad. This leaves the print proper just twice as long as it is wide, the size being six inches by three inches.

The proportions in both cases are clearly chosen with an especial value to effective standing pictures of ladies; and it is probable that in each case a variety of good reasons may be adduced for the proportions adopted, and no change is likely to be accepted in either country. One of the best reasons, perhaps, which now exists for English photographers adopting Mr. Blanchard's size is the fact that mounts, albums, frames, and various other adjuncts for such a size have been prepared and are accessible. Hence if the size be accepted by common consent, sitters having once tried the style, can fill their albums and obtain companion prints of every photographer in the kingdom, to the manifest benefit of all. But, apart from the argument derived from facilities prepared, we think that the proportions of the "Boudoir" portraits are best in an artistic sense. Mr. Faulkner and some others have protested against it as too "lanky," earnestly desiring that the width should be a little greater in proportion to its height. The arguments would apply to the "Promenade" portrait with fourfold force. Whilst the proportion of width to length in Mr. Blanchard's pictures is, speaking in round numbers, as two to three, in the American picture it is but as two to four. In Mr. Faulkner's interesting communication in our last, he gives the actual proportions

of the canvases for varied styles of portraits which have acquired a classic character by universal acceptance amongst great painters. As it will be seen, they are, in the majority of cases, much wider in proportion to length than the usual sizes which have of late prevailed in photography. But this table of sizes really affords a very strong argument in favour of the proportions adopted in the "Boudoir" portrait.

As Mr. Faulkner rightly remarks, the proportions of portraits in photography may surely be safely called on the same principal adopted by great artists who have painted portraits; and it will be seen that the standing whole-length portrait of seven feet ten inches by four feet ten inches is, as nearly as it is possible to be, of the proportions adopted by Mr. Blanchard in the "Boudoir" portrait, which is essentially intended for standing figures.

It is possibly a misfortune that no facility of any kind exists for intercourse and consultation between professional photographers on points interesting to the profession. If any organization existed for such a purpose, subjects like the one to which we have been referring might fittingly be considered and decided, either by the general voice, or by that of a committee of taste duly accredited. In the multitude of counsellors there is wisdom: and, besides the probability of a satisfactory decision being obtained as to size and proportion, in such a case mutual agreement would secure common action, and all the very definite benefits which arise from universal consent in introducing a novelty to the public. Meanwhile, we heartily echo Mr. Faulkner's demand for facilities, especially in the shape of albums, for some other proportions better suited for half-lengths, busts, &c., than those of the card and Boudoir portraits, which are manifestly best suited to the rendering of whole-length figures. There is no better method of creating and increasing demands for portraits than their display in the proportions and with such entourage which gives them their highest pictorial value. Good taste in this respect can add attraction to any work, whilst bad taste may deprive the finest picture of its real value. All portraitists have, therefore, an interest in giving weight to Mr. Faulkner's appeal to manufacturers to depart a little from the cut-and-dried groove, and furnish the desired novelties.

PHOTOGRAPHY IN THE WEST.

THE tide of civilization and progress throughout the world's history has flowed westward, and the course of photography, as one of the most interesting developments of civilization, is certainly no exception to the general law. In the early days of the art it made much more rapid strides in America than in the Old World; and, if we may judge by many of the evidences which come under our attention, the set of the tide of photographic progress is still westward, even on the American continent. The next meeting of the National Photographic Association will be held in San Francisco, the city in which the President of the Association (Mr. W. H. Rulofson) is a distinguished photographer. But amongst the cities of the Western States it is Chicago which attracts attention as a city in which photography especially progresses. It is the home of a large number of exceptionally skillful portraitists; it possesses an active and successful photographic society; and it has recently commenced the issue of a most interesting and promising photographic journal entitled the *Western Photographic News*, published by Mr. C. W. Stevens, proprietor of a very large and flourishing photographic depot, and edited by Mr. G. A. Douglass, Secretary of the Society. The annual dinner of the Photographic Society, held some weeks ago, appears to have been on a very grand scale, and the proceedings singularly successful and interesting. We were fortunate enough to receive an invitation to this dinner; but, unhappily, the few thousand miles which intervened proved an insuperable obstacle to

the pleasure we should have had in meeting the Chicago photographers. The very handsomely printed ticket, and a *menu* including nearly a dozen courses, forwarded, enable us, however, to form some idea of the style in which the thing was managed. A circular issued about the same time—dating, as is the fashion with another craft, *anno lucis*, in place of *anno domini*—sets forth the varied advantages of the Society, and invites attendance at its meetings.

Photography in Chicago is a sufficiently prominent fact to demand the prominent notice of the daily press of the district, and a number of the *Chicago Tribune* before us devotes nearly four columns to a very well written history of photography in Chicago, with notices of the most prominent photographers at present practising there. In Chicago, we are told, "the benefits of this great modern art were offered to the public in a rude, aboriginal fashion within eight years after the first publication of the discovery in France," and "the interest has since developed with a rapidity unparalleled in any other department of industry, until the business, at the present time, is represented in seventy-eight galleries, giving employment to three hundred operatives, besides those engaged in stock houses and other branches of commerce connected with the art. There is probably no other city in the world," the *Tribune* adds, "where photography has attained a higher degree of efficiency and practical perfection, or where a higher order of intelligence, enterprise, and skill are exercised in the interest of the art, than in Chicago." A detailed notice of the studios of a number of the leading artists follows, and of the chief places of business associated with the art. Amongst the latter, the "Great Central Depot" is described as an "extensive four-storey marble-front building," and its proprietor, Mr. Stevens, the proprietor of the journal to which we have referred, as probably "the most extensive importer, manufacturer, and dealer in the west." Our readers will probably agree with the *Tribune*, that in no city does photography appear to have attained a higher position or greater vitality than in Chicago, the Garden City.

THE SOLAR ECLIPSE.

DR. HERMANN VOGEL, of Berlin, our readers will remember, accepted the invitation of the Royal Society of London to take part in the Solar Eclipse Expedition, to observe the eclipse which took place last Tuesday, the 6th inst.; and our esteemed colleague has sent the following account of the observations which it is proposed to make to the *Photographische Notizen*:—

From many sides I have had questions touching this new expedition to India addressed to me, and I cannot do better, I think, than answer them in your journal. It is a question of another solar eclipse when the sun will be completely hidden by the moon for a space of three minutes, so that only such portion of the great luminary is visible as stretches out beyond the margin of its disk (that is to say, the atmospheres surrounding the sun), and these appear to be of a most wonderful nature. In the first place, there are carmine red flame-like forms, which here and there project from the obscured orb: these are the protuberances. Then around the luminary again is a broad white halo of glory, as it were, of irregular form, which is called the corona. When, in 1868, the Eclipse Expedition went out to Aden and to India, it was one of our duties to fix the form of the protuberances by photography, and this we were enabled to do. It was found, however, that in the pictures taken at Aden, and in India an hour later, the form of the protuberances changed, and that they had no fixed shape, but altered pretty much as our clouds do. At the same time it was proved by observations made with the spectrum that the protuberances were nothing more than glowing hydrogen gas. This was not difficult to prove. If, for instance, a spectrum apparatus is directed towards a tube in which hydrogen gas is warmed to a

glowing heat by the passage of electric sparks, there are to be seen in the spectrum three bright lines—a red, a light blue, and a dark blue line. When directed towards one of the protuberances of the sun, there are to be seen precisely the same three lines; therefore it is obvious that one is looking at glowing hydrogen. At the present day we have arrangements by means of which these bright lines of the protuberances may also be seen in full daylight without an eclipse, and it has been seen how these strange forms appear and disappear rapidly, as if they were mighty explosions of gas upon the surface of the sun. They are not problems to us any longer, and in the more recent solar eclipses we have therefore directed our attention more especially to the halo of light, or corona, of the sun.

In America, in 1869, an attempt was made, and successfully, to photograph the corona. The protuberances are brighter, and impress the plate more quickly, five seconds' exposure being enough for even a weak lens. Much less vigorous is the light from the corona, for in this case eight times the exposure is necessary. In such a picture as this the protuberances appear over-exposed, but the corona appears fully. That the camera is constructed in the form of a tube, and not in the ordinary box shape, is a matter of little import in solar photography; but that the stand should be connected with a clockwork arrangement to move the camera at the same rate that the sun—or, rather, the earth—is moving, is of the highest importance. A great deal depends upon the care with which this movement is controlled, for if the camera does not quite follow the course of the sun, an unsharp image is the result.

In this way both corona and protuberances have been photographed, but in the former case the pictures have taught us little. Here again the spectroscope came in to solve the problem. Different bright lines were to be seen on examination of the corona, which were different from those furnished by the protuberances, and the nature of these lines we have yet to learn. For this reason it is that we are making fresh observations of the solar eclipse, in the hope of clearing up the matter. As, however, the eclipse only lasts a short time, and during the brief period at the observer's disposal many things may be overlooked, photography is now to step in and aid in the spectrum observations. This time we are going to try to photograph the lines so that these may be studied afterwards at leisure. The task from an optical point of view is somewhat complicated. With the camera alone we can do nothing. A spectroscope is necessary in combination with camera or telescope, and the photographic plate lies behind this. A description of the apparatus would lead me too far, but I may briefly say that first comes a telescope, then the stereoscope, and then the photographic apparatus, all three on a stand, which is moved by clock-work.

The photographic work is carried out by means of ordinary collodion of the most sensitive possible character. No impression is made by the yellow and green lines, but the violet and blue are well reproduced, and it is just these which are difficult to see with the human eye. I shall, however, try to reproduce the former with my prepared bromide plates, which, it is well-known, are sensitive to the green and yellow portions of the spectrum. The difficulty to be overcome is the circumstance that in spectrum photography but very little light enters the camera, and, consequently, a very much longer exposure is necessary than in the case of depicting corona.

The eclipse at which this interesting experiment will be made lasts three minutes. The exposure of the plate cannot last longer than this, therefore, and we must hope that it will suffice. There are other difficulties, such as those connected with a hot climate, &c., but if there is a supply of ice handy these should be overcome without much ado. A great deal, of course, depends upon the nature of the apparatus, and the quality of the telescope employed.

The Royal Society of London, which has organized this expedition, invited three foreign savans to take part in it—a Frenchman, an Italian, and a German. Responding to the call, I am now on my way to the field of operations, this being the third Solar Eclipse Expedition that I have undertaken. The party go together to Ceylon, and then we divide; one portion goes to Siam, one to the kingdom of Birmah, and one to the Nicobar Islands. I am going to Birmah. Besides myself, there are other photographers, whose task will be, however, but the depiction of the corona. It is only with the photographing of the spectrum that I have to do, and it is hoped that the aid of some of the members of returning Transit of Venus parties may be pressed into the service. Several gentlemen have been telegraphed to to await our arrival at Ceylon. The eclipse takes place on the 6th April, and after that I propose going on to India to undertake some experiments relative to the intensity of light in that country. After my experiences I will relate further in another letter.

SEASONABLE THOUGHTS SHOT AT RANDOM.

BY W. T. BOVEY.

ALTHOUGH the respective operations connected with silver printing have been exhaustively dwelt upon by writers innumerable, and theorists have vied with professional practitioners in making all things connected therewith clear to less gifted inquirers, yet, somehow, an important matter belonging to the process, known as toning, has been overlooked, and it is with the omitted information alluded to I purpose now to deal.

For years past I have never ceased to warn photographers against that rigorous trustfulness they are but too prone to place in formulæ; and I have from time to time endeavoured to show how evils complained of might be averted if printers could only be persuaded to make their work a trifle less mechanical. That a foolish reliance on the virtues embodied in so many ounces, grains, or drachms, is, as a rule, the way to failure, I have proved a thousand times in my earlier experience. That success depends on an intelligent guiding hand it is now my desire to show.

"Beautiful Spring" brings with it something more than plum blossoms and primroses, for with these pleasant months the photographer associates his often longed-after time when the air above is charged with plenty of actinism. March, April, May, contain red-letter days, more especially for the printer, who, without experiencing the exhausting heat that comes with later months, can go from frame to frame, and find in each the very best impressions the negatives are capable of producing; and if he has any but a sluggish, unappreciative nature, his whole soul glows with pleasing anticipation of a glorious crop of prints to place before his employer on the coming morrow. With extra care he trims and washes his prints, the required preliminaries which precede the toning. He mixes his gold solution, as per written rule, places it in a well-washed dish, immerses the prints, and then come his spirit-dampening troubles. The pictures tone so extraordinarily fast his nimble fingers cannot keep the colour within desired limits; and, what makes the matter worst of all, there is no fugitive colour to be removed by the hypo. Ultimate results: inkiness, absence of richness, even though there be no loss of vigour. Now the reason why of disasters such as just described is by no means difficult to discover. Spring time presents all the requisites for extra perfect printing. The air is cool and moist, the chemical rays are at their maximum vigour. Under such favourable conditions the prints produced possess enlarged magnetic attraction, and in that state need a very weak gold solution to tone them; otherwise, if the ordinary strength is given, the gold is hastily deposited, and certain blackness follows. In my own practice, I have, day after day, for the past three weeks, been adding to my toning bath from two to three grains of gold daily, and have found that quite enough to tone over a

quire of paper; i.e., I give the gold fair play, be it remembered, not bothering it with haloid adjuncts, acetates, carbonates, and so on. Very wrong in me, doubtless, thus to bid defiance to popular opinion. Fact of the matter is, I succeed, and cannot, for that reason, afford to part with eccentricity. To those who at this time are troubled with that "nasty unreliable paper," which at first toned so nicely, but now yields colour of ink, I tender this advice: reduce materially the strength of your toning solutions; and for guidance I once more repeat: a print, to be brilliant, must have merely a transparent glaze of gold, for if the red beneath is killed by too opaque a covering, blackness results, and adieu to translucent tints of ravishing richness.

FUMING WITH AMMONIA.

Apropos of this subject, I am sorely puzzled when I notice among the queries addressed to Mr. Editor an inquiry whether fuming with ammonia makes any difference in the quality of the prints. Surely the best answer to such questions would arise from actual trial. I practised this system several months, and am thus enabled to say that under certain conditions there must be placed to the credit of fuming an important amount of advantage, more particularly with low salted papers, or where acetic acid has been sparingly mixed (a most pernicious practice) with the albumen to make it more easily workable. In establishments where a considerable quantity of paper is used every day, however, the process of fuming consumes too much time; and for that reason I have taken some pains to obtain the advantages that arise from the practice without the trouble of submitting the sheets to the ammonia exhalations, and after many trials discovered that with a judicious admixture of chloride-ammonia with a similar salt of barium, fuming might be dispensed with; at all events, as far as my own work is concerned. Some photographers, believing that an addition of ammonia to the silver bath would serve in lieu of fuming, have tried it, and the experiments have turned out failures. It cannot be too widely known that with the majority of English papers an alkaline silver bath is a sad mistake. Repeatedly I have tried it, and only with the one result: comparative failure. As a rule, I recommend in all photographic operations abstinence from empirical admixture with the active principle that is indispensable in the solutions used; as, for example, for the so-called printing bath, I use nitrate of soda, because it obviates the necessity of using kaolin. The solution never discolours, thus proving that the salt described is a practically valuable adjunct. As for the rest, however, water, a trifling quantity of sugar in winter, and silver just as I receive it from Messrs. Johnson and Matthey. I never have occasion to test the bath, add no acid nor alkaline agency, and, by leaving well alone, am rarely troubled with any printing difficulty other than those which arise from leaden skies, pea-soup-colour fog, and other similar uncontrollable enemies to photography. The silver bath should be neutral, or, if any change from that, very faintly acid. The lines produced with paper floated on solutions that are made alkaline with liquid ammonia are in part fugitive, whilst the acid or neutral silver bath, such as just described, gives the requisite conditions for making the colour produced in the gold bath stable and permanent.

A NEW DISCOVERY—

Which, I presume, means that I shall shortly be informed of no end of persons who knew it, but who, being modest, kept the secret for private circulation. A few weeks since I had a rare hunt after the cause of orange-tinted spots of various shapes which occasionally spoiled a few of my prints. I thought at first they arose from the presence in the water of slugs, but "couldn't be, neither—the water was too cold." Whilst in the act of hanging up the prints one day, however, I noticed a large black spot in one of the sheets, and thought it was smut. On closer examination, I found the substance was solid, with edges jagged and

serrated. Taken between the fingers and removed from the paper, lo and behold! a duplicate imprint was seen on the print: 'twas of the often seen orange hue. On inspecting the solid, I found, 'twas oxide of iron (otherwise the well known iron rust), and I had lighted upon what I now offer as my newest discovery.

I had intended writing of several other matters, but at this instant find that I have already made considerable encroachments on the Editor's patience and space, and so must await some other moments of leisure.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

INTRODUCTION.

It is with great diffidence that I place before the intelligent photographer a series of articles on his art; but a knowledge, formed by an extensive reading of works already devoted to photography and the complaints I have heard so generally expressed of them, as they appeared—of their too theoretical character generally—gives me that excuse vanity demands, that I shall be able to supply a want.

In a study of photographic literature the reader cannot but be struck with the strange diversity of thought and method in the treatment of almost every detail—chemical or manipulatory—of our art, and the beginner, and not unfrequently the finished scholar, in trying to follow out the theories and advice of these teachers, has been thrown into a very undesirable state of "fog," from whence, to extricate himself he has been forced to take charge of the helm for himself, if his knowledge was sufficient, or, as is not seldom the result, to give up in despair. There is, of course, as those who have succeeded know well enough, a great deal that must be studied individually, and a point where the best book ever written as an ally deserts one. A feeling of independence and spirit of self-reliance are indispensable to the student who would excel.

While success is the reward of patience and studious research, there are still the majority who will ever remain in the rank-and-file, who will ever need counsel and advice; and for these it is necessary to provide simple and intelligible rules of working, and the formation of formulae by which, in following, they may overstep the discouraging impediments which beset the first steps of progress in our art. It shall be my endeavour, in placing these before the reader, to do so in as simple language as possible, without any mystifying technicality, and with just sufficient theory to explain *why* each manipulation is conducted, and so let the student pursue a course, not because it is so set down, but intelligently, as a means to a certain end, the which he fully understands. This plan, it appears to me, is, not only one called for by intelligent pupils, but a simplification of tuition. First, what has to be done—that understood, how it can be done—and why the means adopted are the best.

I propose, as my plan, to take the reader by the hand, and conduct him step by step through the various manipulations and processes, just as if he were a pupil in a gallery; to fight his way, as the writer has done, from glass cleaning, where he learns his first great lesson that

NOTHING CAN BE DONE TOO THOROUGHLY!

He will then be introduced to the Dark Room, and its construction explained. The chemicals will next be brought under his notice, and their use and properties explained, in order that his dark room manipulations may not be gropings in the dark indeed. Here I shall take advantage of the opportunity of impressing on the reader, that whatever may be of service in these pages, may be rendered of no service to the reader who, after a careless perusal, throws it aside, or by a loose and inefficient method of

practising the directions here set down, or a slovenly and dirty manipulation.

PRECISION

is absolutely necessary. How is it possible to judge the effect of a formula without a strict adherence to the quantities and directions set down? How often we see an operator, in the perusal of a book or journal of his art, come upon a formula which promises well; say a developer, than which there is hardly a more delicate agent, liable as it is to variation by heat or cold or any trifling change in the proportions of the ingredients. In consequence of his discovery of a new developer, he takes his iron, perhaps kept in a brown-paper bag, which has burst, or in an imperfectly-stoppered bottle, and is, consequently, so oxidized as to have assumed a rusty-grey powdery appearance. In weighing out an ounce, he may put in an extra crystal. He solaces himself with the thought, "that just turns the scale," and proceeds in like haphazard manner to measure out his acid. Water he scarcely thinks worth taking the trouble to measure. He feels satisfied, and with a too easy conscience proceeds to try this thoroughly original developer. If it answers, he feels pleased, and a glow of self-satisfaction comes over him; but reproduce it he cannot! Or if, as is most likely to be the case, it does not answer his expectations, and the promises made for the developer *he has not made up* are not realized, he throws it away with the angry remark, "I never did learn anything from these books—shan't try any of their formulæ again," which is a very wise determination to come to in such a case.

But it may happen that he may have taken every care as regards the proportions of the solutions, weighed and measured them out with exact nicety; but he is not a believer in that principal of photographic virtues,

CLEANLINESS.

Some foreign substance has been mixed up with the solution, caught up with the iron or organic matter in his bottles, or from his fingers. Then, in the test, the collodionized plate is stained with marks of his dirty fingers; he throws a quantity of the developer over the plate, allowing most of it to spill into the sink, carrying with it most of the silver from the plate, the retention of which is so necessary to a proper determination of the value of the formula—indeed of beauty of the negative—and the result is stains, streaks, spots—and disgust.

You cannot too early or too thoroughly learn these two cardinal virtues of precision and cleanliness. It is observable in every movement of the first-rate operator: the neatness of his person as far as the nature of his work will permit, and in the order, cleanliness, and readiness of every camera, lens, chemical, bath, solution, and what not under his care; and the neatness of the reception, operating, and dark rooms—these are the evidences; the result is perfection. I do not by any means intend to say that a clean and careful operator is always a clever one; but with these qualities he is always at his best, while the talented, slovenly man is at his worst. Even if it does sometimes appear that an admired worker in the dark-room or printing department is not as painstaking as he might be, this is more apparent than real, for some of the hard rules are of necessity relaxed by the master of his business.

Cameras should always be ready for use, free from dust, and in good repair. Spare lenses should be placed where they are not liable to get injured. The posing chairs and accessories of the glass house, kept free from dust and stains, last longer, and present a better appearance to the sitters. When necessary to move a chair, background, or headrest, it can be done as expeditiously quietly, as with a great noise and racket, which not only annoy your customers, but destroy your property.

Order and neatness should reign in the chemical room, and are observable in the arrangement and legible labelling of all bottles and other vessels. Funnels should be kept clean and to their proper uses, and the filtering paper

ready at hand. In the dark room, which has generally to serve as a chemical room, also—though this should not be if it is possible to set aside a separate apartment for the reception of chemicals—there is great scope for the display of neatness and convenience of arrangement. The carriers should stand near the silver bath, which should be kept well covered when not in use, to preserve it from dust.

On a shelf over or beside the sink should be kept the developing solution and glass, free from dirt and crystals of iron, which will collect round its sides if it is not constantly cleaned. From this cause alone many negatives have been ruined. The collodion bottles, handily placed, ought to be well looked after; the lip of each bottle on which the collodion collects should be wiped each time after using, thus guarding against many of the spots and stains which so trouble operators. Above all, the floor of the dark room ought to be very clean (mopped out every morning) that, in moving about, the operator does not raise a cloud of dust, the particles of which find their way into bottles and solutions, on to coated plates, and create mischief in a thousand and one ways. Order and cleanliness, in short, should reign supreme.

I am sure no thoughtful reader needs further examples of the mischief done by the neglect of these rules. If the consequences in his own business are not serious enough, let him think of the effect of an overdose of a drug by a chemist in making up a prescription, and in many other ways he may think of in a moment, and let him take the lesson to heart.

I hope this little sermonette has not been preached in vain, but that its lesson will show its work as we go on with our studies. The dark room work mastered, as far as it can be at this early stage, the student will be introduced to the glass house, to learn its construction, the effect of light on the salts of silver, lighting the figure, and the general work of this department, with a few hints on artistic posing.

On this head I shall be content to give only some general rules, leaving the higher perfection of the student to his own knowledge of art and many splendid works already written on the subject—notably Mr. Robinson's book on Artistic Photography, which every photographer with ambition to excel ought to possess.

Printing the negative will next engage the attention of the reader; but in this, as indeed in most of the manipulations and processes of our art, practice is the great thing necessary. It is much easier to explain orally, and show the pupil how to do a thing, than it is to write plain and understandable instructions; and it is in this respect that all books of instruction in an art fail to a very great extent.

(To be continued.)

PHOTOGRAPHIC EXPERIENCES IN PARIS.

WE have been favoured by Monsieur Adolphe Beau with the following, translated from a French paper:—

"So great is the number of photographers in Paris, that should a few of them happen to die off suddenly, it would hardly be noticed. People live long in the photographic line, and perchance they might never die, were it not for ugly women. Ugly women are, indeed, to photographers what parsley is to parrots. Ugly women will be made pretty, and they positively howl when a true likeness is shown to them.

"At the studio of a photographer of my acquaintance is a lovely portrait of Blanche Pierson (the actress) before the war. It is a coloured, fair, pink, smiling likeness, with a certain piquant and roguish expression; just a little bit of a shoulder, the arm bare, the hand half closed, and, in a word, a pose which in itself may be termed a good luck—a fortune—a god-send.

"Then some horrid creature, thin, angular, with a dark yellow skin, a broken nose, and protruding jaw, comes into

the studio and undergoes the operation. She has the shoulders bare (churchyard shoulders); uncovered arms (vampire's arms); a hideous and satanic smile pervades her face from left to right; and long teeth, as if made of orange peel, bite her upper lip.

"The proofs are printed. The lady was to come on the following day. She has come. The print has been made to beautify her as much as could be. Lilies and roses have been lavished all over her person. However, she recedes with flashing eyes and dilated nostrils. 'What an awful thing this is!' says she; 'you must have done it on purpose; it is monstrous!' 'Madam,' stammers the photographer, 'we cannot do better.' The lady, suddenly discovering the portrait of Mlle. Pierson, exclaims, 'Look here!—this is how I mean to be.' 'Well, then,' answers the photographer, 'take this portrait home, and say it is you.'"

Correspondence.

PHOTOGRAPHING LARGE GROUPS BY MAGNESIUM LIGHT.

SIR,—Application was made to me a short time since to take a photograph of a fancy ball by the magnesium light. It was proposed that I should be stationed on a gallery, and take a general view of the company. I expressed some doubt as to its success, and was told "the thing had been done," and it was considerably added, "Of course they would have to stand still for the purposes."

I declined to undertake it. Can you, or any of your readers, inform me whether such a thing has been done successfully?—Your obedient servant,
D.

[Have any of our readers had experience in this direction?]

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held at the Free Public Library and Museum, on Monday, the 5th instant; the Rev. J. D. BILEY, President, in the chair.

The minutes of the previous meeting were read and confirmed.

MR. HOULGRAVE exhibited a number of negatives to show the excellence and keeping qualities of plates by the emulsion-without-washing process, as prepared by Mr. Bolton's formula. Several of the plates had been kept eight or ten months, and with them were shown companion pictures taken on plates by Major Russell's tannin and bath formula, showing the superiority of the former, although Mr. Houlgrave had previously practised Major Russell's process. He (Mr. Houlgrave) said he now preferred to use Mr. Bolton's pellicle process to any other he had tried, there being so little liability to stain or spot the plates consequent on the little handling they had in their preparation.

THE Rev. H. J. PALMER showed some interiors of Beverley Minster, taken on Kennett's gelatine plates. The exposure had been only one minute ten seconds in December last. Every detail was there, and he (Mr. Palmer) would not have given, with his experience in taking interiors, less than an hour with any other dry plate.

THE PRESIDENT then read a letter from Mr. H. Baden Pritchard in reference to a fund that was being collected for the widow of the late Mr. O. G. Rejlander. He (the President) or the Secretary would be glad to take charge of any subscriptions that were sent in.

The members then adjourned to the Lecture Hall for the purpose of holding a "popular" meeting. Here they were joined by a large company of their friends.

THE PRESIDENT, in opening the proceedings, said that the lantern entertainment they were going to present that evening could scarcely be given as a continuous lecture, the object being more to show a miscellaneous collection of transparencies selected chiefly for their novelty and interest, and also for their beauty and excellence as photographs. The transparencies had been nearly all produced by Mr. F. York, of Notting Hill, London, who had

been wonderfully successful in obtaining from life the portraits of so many of the animals in the Zoological Gardens. Many of these would be shown on the screen, and also a selection of Mr. York's beautiful views of London, India, and America. The members were greatly indebted to Mr. York for his kindness in granting the use of them for the evening. They had also to thank Mr. Knott for the use of some of his excellent views of American scenery, as this would enable Mr. C. Dawson (who kindly undertook the duty of lecturer) to give them a graphic description of a country with which he was intimately acquainted.

Mr. Knott then entertained the company for nearly an hour and a-half with a series of views, &c., the excellence of which was continually manifested by the applause of the audience. The entertainment was rendered all the more enjoyable by the amusing remarks and descriptions of the lecturer, who seemed equally "at home" in America, India, London, or with the animals in the "Zoo."

Talk in the Studio.

CERTAINTY AND PERFECT CONTROL IN LIGHTING.—Mr. Vanderweyde has just invented and patented a form of studio, or method of lighting a studio, which gives the most singularly complete control over the direction of the light that can be conceived. Having visited almost every studio of note, not only in this country, but in America and Continental Europe, he has been struck with the inefficiency of many of the arrangements for lighting the sitter, and with the small amount of light reaching the model, compared with the amount reaching the windows of the studio, and with the want of control over the direction of the light generally prevalent; and observation and reflection have led to the invention of a new system. Judging from the model studio we have seen, the concentration of the light and the control afforded are most admirable. All the light entering the studio is of absolute use in lighting the model, who may be perfectly illuminated at whatever point of the studio he may be placed, and all other light not doing work absolutely cut off. We hope shortly to place fuller details before our readers.

THE SOLAR ECLIPSE.—The *Times*, referring to the eclipse of the 6th, says:—"The most striking thing about the Royal Society programme is its simplicity. For the first time in Eclipse Expeditions, no eye observations are arranged for; all the phenomena are to be photographically recorded. Here we see the enormous advance which has lately been made in these studies; for we may remind our readers that in 1871, when the Astronomical Society were appealed to use their influence to secure observations of the eclipse of that year, a committee of that Society would not agree to employ photography at all!" An article in the *Daily News*, accredited to Mr. Proctor, referring to the same subject, says:—"Apart from the work which Vogel and Janssen may be expected to accomplish, we know that a party of observers from India will be at work; and that Mr. Davis, the photographer of Lord Lindsay's Transit Expedition, will also be on the scene of action with well-trained assistants, and excellent means for photographing the corona. Good photographs of the corona on this occasion will throw important light on questions of solar physics. The sun during the eclipses of 1870 and 1871 was marked by many spots, indicating a condition of great disturbance. The corona photographed on those occasions was therefore the corona belonging to a disturbed sun. Now it has been noticed by Professor Young, of Dartford College, N.H., that as the spots have gradually diminished in number during the last three or four years, the coloured prominences have become smaller and less brilliant. Mighty outbursts of glowing hydrogen (or else of matter flung from the sun's interior through the hydrogen atmosphere of the sun) had occurred frequently during the years 1870, 1871, and 1872. Some of those volcanic explosions had been characterised by an inconceivable violence. It was during one of these, which occurred on September 7th, 1871, that matter was ejected from the sun to a height of more than 200,000 miles—that is, to a height exceeding eightfold the entire circumference of our earth. But latterly no great eruptions have taken place, and the evidence tends to show that in some way as yet to be explained, the solar prominences and the solar disturbances indicated by the presence of spots are associated together—possibly as arising from one and the same

form of internal disturbance. Now it will manifestly be a matter of extreme interest to ascertain whether the inner bright corona and the outer, more complex and partly radiated corona, sympathise, so to speak, with the condition of the sun's interior. Hereafter it may be hoped that photographs of the corona will be secured (if possible) during every total eclipse of the sun, so that we may learn something of the laws of periodic change which doubtless affect this wonderful solar appendage. It may be, too, so strangely has the domain of our sun been, as it were, extended outwards by recent researches and theoretical investigations, that the zodiacal light (probably an extension of the outer corona) may be found to undergo changes corresponding with those thus recognised in the corona. Should this prove to be the case, we should find in the sun, not the solitary globe which former astronomers recognised, but a mighty nebula, with a glowing centre girt round by envelope after envelope of gaseous, meteoric, and cometic matter. It is to photography that we must chiefly look to secure this triumph, seeing that the solar envelopes intermediate to the bright prominences and the corona cannot be examined or measured, their nature determined, or their changes noted, without the aid of photographic records."

LA MORALE PHOTOGRAPHIQUE.

Our duty enjoins us to make friends of foes,
But against it proud science contends;
Though not meaning the weightier command to oppose,
She instructs us to make phos of friends.—*Judy*.

COLLODIO-CHLORIDE.—*Anthony's Bulletin* says:—"A very good way to make collodio-chloride of silver print richly and tone well is to put into a separate bottle the quantity you desire to use at any particular time, and to add to that a drop or two of concentrated ammonia. It will not do to add the ammonia any considerable time before using."

BLACKENING SHEET ZINC.—The following is a new process lately discovered for obtaining zinc sheets of a solid black colour:—The sheet of zinc is cleansed by hydrochloric acid and sand, and then plunged into a solution of equal parts of chlorate of potash and sulphuric acid. A slight velvety-black deposit is immediately formed. The plate is carefully washed with water, allowed to dry, and then plunged into a solution of asphalt in benzine, left to drain, and rubbed with a piece of cotton rag.—*English Mechanic*.

HOW TO GLAZE A DARK ROOM.—Mr. A. W. Bingloey says, in the *Western Photographic News*:—"Dissolve dragon's blood (which is not expensive, and can be obtained at almost any drug store) in alcohol, and add the solution to a varnish (best made of shellac and alcohol) until you obtain the requisite depth of colour. Varnish your plates of glass with this as you would a negative, and glaze your dark room windows with it. The cost is but little in addition to that of the glass, and is as effective, and, I may add, almost as durable, as stained glass. According to the quantity of dragon's blood used, any shade, from a deep ruby-orange colour to a light orange, can be obtained. For lamp shades the coloured varnish can be applied with a brush."

To Correspondents.

J. W. DAWSON.—In making the iodide of mercury intensifier to which you refer, the solution of iodide is added to the mercury solution a little at a time, shaking the solution between each addition, and continuing as long as the red precipitate formed is taken up and re-dissolved. When a slight precipitate is formed, which is no longer re-dissolved, the preparation is complete, the mixture forming the intensifier, which is to be diluted for use as directed. The precise amount of dilution is unimportant, but a very dilute solution is safest for use. 2. You must state the precise formula you employed in making an alkaline developer, to enable us to explain.

T. M. G.—d.—We have given instructions for producing collodion transfers very repeatedly, and cannot possibly devote sufficient space in this column to repeat the details. You will find many articles in the back numbers of the *News* and the *Year-Books*. In our *Year-Book* for 1874, page 74, you will find full instructions. We have also given various recipes for the preparation of non-actinic glass. Orange chrome (ground in oil, and supplied in tubes by artists' colourmen) added to mastic varnish will answer well.

J. H.—One of the best semi-transparent coatings for partially obscuring glass to obstruct the direct rays of the sun is a dilute solution of starch applied hot.

ADOLESCENTS.—There are two reasons for the reticulation of the carbon film. One most common is the use of water too hot in developing; and another, the carbon tissue having been kept too long after sensitizing.

NEGATIVE.—At one time it was the custom to keep the negative bath scrupulously guarded from the light; but it is now common, and wise, to keep the stock solution, when not in use, in white glass, exposed to full light. A wide-mouthed bottle, with a piece of muslin tied over to avoid dust, is better than a stoppered bottle. This allows accumulated ether to evaporate, and the light reduces and throws down accumulated organic matter which has combined with the silver.

H. C. B.—A north light falling on the sitter is unquestionably best, as it is much more uniform throughout the day. Any aspect which brings the sitter into a light from the south involves constant trouble with direct sunlight. We fear that your aspect will involve some trouble, as the sitter will be illuminated with light from the south-east. You do not state the size or proportions of your projected studio, hence it is very difficult to give you any advice as to the proportion of glass to be employed. Of course both ends will be opaque, and as you build against a wall the west side must be opaque. On the east side let six feet next the sitter's end be opaque, and let the same amount, or two or three feet more, of the roof at that end be opaque. Then have ten or twelve feet of roof and sides glass, the glass at the side coming within twenty inches of the ground.

LEARNER.—The collodion peeling from the glass in drying may proceed from various causes. One of the most common causes is the use of a dirty plate. Another cause is under-exposure and prolonged development. Another cause is imperfect quality of the collodion. Another cause, excess of acid in the bath. The slight crystalline deposit of silver in the shadows may be due to pushing the development too far. Sometimes it is due to the use of a newly mixed developer. Adding a little of an old developing solution will often prove a cure for this in glass positives.

B. K. W.—That marked D, of the rapid form, will answer well, or the rapid single lens of the same maker. We have seen some good work by C, but cannot speak as to its rapidity.

COL. MARSHALL.—Thanks. We published some articles on the subject some years ago, both in the *News* and *Year-Book*; but we will give the subject our attention again.

PERPLEXED.—The defects you described are more likely to be due to the collodion than the nitrate bath. The rotten film, the grey shadows, and other symptoms, all indicate the use of an old decomposed collodion; and such a collodion would tend to the production of grey fog and of a scum forming in development. 2. To throw down silver as a chloride with hydrochloric acid, it is only necessary to add the acid to the nitrate solution a little at a time, continuing as long as any precipitate is thrown down.

C. B.—The strong affinity of sulphuric acid for water undoubtedly gives it efficiency as a desiccating agent in a drying box, and the commercial oil of vitriol is of a sufficiently uniform strength to answer every purpose. How often it would require renewing could only be ascertained by experience, and, of course, would be governed by the amount of the acid used and the amount of aqueous vapour to be absorbed. Whether its efficiency as a desiccator is sufficiently valuable to counterbalance the risks and inconveniences of its use, we cannot say, nor have we any record at hand of its use in drying boxes. We should hesitate to recommend its use. Thanks for the contribution to the *Rejlander Fund*, which shall be duly handed to the treasurer.

AMATEUR.—The causes and remedies for blisters in prints have been much discussed, as you will ascertain on consulting recent volumes of the *PHOTOGRAPHIC NEWS*. The causes are various, as are, of course, the remedies. In the first place, they most frequently occur in highly albumenised paper. Short floating on the silver bath, by which the film of albumen is not thoroughly coagulated throughout, is a frequent cause. Longer floating, or immersing the print in alcohol before toning, is a remedy. Adding alcohol or ether to the hypo bath is found by some to be a remedy. Immersing the print in a strong solution of alum after toning and fixing is recommended as a remedy. Immersing in a strong solution of salt and water, after fixing and before washing, has been found beneficial. Immersing the print in the fixing bath without washing after toning is sometimes a cause, and should be avoided. Sometimes they show after the print is dried, and are then, of course, injurious.

C. A. M. W.—We regret exceedingly that the number for Feb. 27, 1874, is out of print, and we do not know of any method of procuring a copy, except the chance of advertising. If we can hear of one, we shall have pleasure in letting you have it.

W. N. M.—The simplest and only efficient plan will be to advertise in our pages for an engagement as assistant operator.

L. L.—Experience alone will furnish a satisfactory answer to your query. To decide such a question a long series of comparative experiments would have to be undertaken, and at present we have no evidence. Our prepossession would be in favour of the uranium.

W. H. WATSON.—Many thanks. We reproduce the original article, as you will note, in the present number.

MESSES. HARVEY, REYNOLDS, and Co., and J. BYRNE.—Thanks. In our next.

Several Correspondents in our next.

REJLANDER MEMORIAL FUND.

Subscription received:—

C. B. £2 2 0

METEOROLOGICAL REPORT FOR MARCH.

BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven, 36 feet above sea level.

BAROMETRIC PRESSURE.				TEMPERATURE.			Direction of Wind at 9 a.m.	REMARKS.
Date.	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1	29-77	29-80	29-84	34°	38°	34°	N.E.	A little snow a.m. and p.m.
2	29-86	29-84	29-82	31	38	36	N.E.	Fair, but gloomy.
3	29-82	29-85	29-90	31	44	32	N.W.	Fair, but gloomy.
4	29-90	29-87	—	32	41	32	N.N.E.	Fair, but gloomy.
5	29-80	29-78	29-65	31	42	38	S.W.	Fair, but gloomy. Very windy at night.
6	29-42	29-41	29-30	41	46	46	S.	Showers a.m. and p.m. Very windy.
7	29-37	29-47	29-52	44	47	44	S.W.	Rain a.m. Gloomy all day.
8	29-71	29-78	29-60	45	46	46	S.W.	Rain a.m. & p.m. Very heavy at night, with strong wind. Foggy.
9	29-48	29-76	30-10	44	46	40	N.W.	Fair a.m. Rain and strong wind p.m.
10	30-26	30-22	—	33	42	38	N.E.	Fair and sunny.
11	30-14	30-10	30-06	33	41	37	N.E.	Fair, generally sunny.
12	29-98	—	29-95	36	43	38	—	Rain morning & evening. Gloomy all day.
13	29-95	29-94	29-98	36	40-5	38	S.W.	Fair, but gloomy.
14	30-00	30-01	30-02	41	45	34	N.W.	Fair and sunny. Very fine.
15	30-06	30-07	30-07	36	43	33	N.	Fair and sunny. Very fine.
16	30-03	30-01	30-07	37	43	38	—	Fair and sunny. Rather hazy.
17	30-29	30-39	30-50	40	43	38	S.E.	Fair and sunny.
18	30-48	30-39	30-18	33	40	40	N.	Rain at night. Gloomy all day.
19	30-00	—	30-00	42	—	34	S.W.	Fair and sunny.
20	30-05	30-04	30-00	34	40	33	N.W.	Fair and sunny.
21	30-00	30-00	30-00	33	41	41	—	Rain a.m. Foggy.
22	29-96	30-00	30-05	40	50	46	N.W.	Fair. Gloomy. Foggy.
23	30-19	30-20	30-19	43	48	38	S.W.	Fair, but gloomy.
24	—	30-19	30-15	43	50	46	S.W.	Fair, but gloomy.
25	30-05	30-00	29-94	45	47	46	S.W.	Rain a.m. & p.m.
26	29-90	29-89	29-88	44	46	43	W.S.W.	Sunshine & showers a.m. & p.m.
27	29-80	29-82	29-89	43	46	40	S.W.	Heavy showers a.m. & p.m.
28	30-01	30-10	30-16	45	46	43	N.W.	Fair, generally sunny.
29	30-20	30-22	30-28	46	48	43	S.	Fair, generally sunny.
30	30-32	30-34	30-40	45	50	44	S.W.	Fair, generally sunny.
31	30-42	30-42	30-42	48	51	46	W.	Fair and sunny.

From the foregoing I arrive at the following:—

	Mornings.	Noons.	Nights.
Maximum temperature observed	... .. 48°	... .. 51°	... .. 46°
Minimum ditto	... .. 32	... .. 35	... .. 32
Mean ditto	... .. 39-3	... .. 44-4	... .. 39-3

Mean of whole 41°

Number of fair days	... .. 20
Number of days on which more or less rain fell	... .. 10
Fair days, gloomy	... .. 8
Fair days, sunny	... .. 12

Braystones, near Whitehaven, April 5th.

PHOTOGRAPHS REGISTERED.

MR. T. WINTER, Waterford,
Three Photographs of the Very Rev. Father Burke, O.P.

MRS. PLUMMER, Louth, Lincoln,
Photograph of Peter Blanchard.

MR. L. BERTIN, Brighton,
Five Photographs of Miss Rose Coghlan.
Photograph of Mr. J. Levy.

MR. R. SMITH, Derby,
Two Photographs of Mr. H. Holloway.

MESSES. SANDERSON and BEACOTT, Gislebore,
Photograph of Mr. H. T. Weatherill.

MESSES. DU VAL and Co., Manchester,
Two Photographs of Rochdale Hunt.

The Photographic News, April 16, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

DR. VOGEL'S ATTEMPT TO PHOTOGRAPH THE SPECTRUM OF CORONA—ALLEN YOUNG'S ARCTIC EXPEDITION.

Dr. Vogel's Attempt to Photograph the Spectrum of the Corona.—The task which Dr. Vogel set himself to do on the occasion of the solar eclipse on the 6th inst. is one of the most interesting that has ever yet fallen to the lot of the photo-astronomer. To find out the nature of the corona of the sun—that bright halo with which all are acquainted who have seen eclipse photographs—is the great problem just now before astronomers; and to clear this up satisfactorily we want something more than the report of an observer who has examined the phenomenon by the aid of a stereoscope. In the first place, the time at the latter's disposal is but three short minutes, an ample period enough if it were a question of merely recording the presence or not of the lines of a certain metal; but as it is a close examination of the whole spectrum that is required, and an accurate account of many lines, the task is almost impossible in the short limit available. Dr. Vogel is going to photograph the lines in the spectrum, therefore; and although he cannot reproduce the colours, still the position and nature of them in monotone upon his plate will demonstrate plainly what they are. He would, however, merely get a record of one end of the spectrum only if he worked under ordinary conditions; for it is but the lines in the violet and blue (and, perhaps, green) portions that would be impressed upon the sensitive plate. Of the lines in the orange and red he would get no trace, and therefore, after all, a very imperfect photograph of the spectrum would be secured, such as might be a great aid to the astronomer, but which would not wholly satisfy him. Dr. Vogel hoped that by employing his tinted films of bromide of silver he might be enabled to reproduce the whole spectrum intact, availing himself of the important discovery he made last year. This discovery—which, our readers will remember, gave rise to much controversy at the time, Dr. Vogel combating single-handed against a whole host of experimentalists arrayed against him—was to the effect that if bromide of silver is tinted yellow or red, it becomes sensitive to the red and yellow portions of the spectrum, the maximum sensitiveness of the plate being for these particular rays, and not for the blue and violet to which ordinary plates are most sensitive. Dr. Vogel found out, indeed, that by adding to bromide of silver any colour which absorbs a certain part of the spectrum, the maximum sensitiveness of the plate is for that special colour. The singular importance of this discovery, which has since been confirmed by the well-known French physicist, Becquerel, is at once apparent; for we may now be able to get impressions of the yellow and red, which trouble photographers so much, as readily as blue or violet. Dr. Vogel hoped, by employing tinted plates, to reproduce the lines in the red and orange portions of the spectrum of the corona (during the eclipse); and, should he have been successful in doing so, he will be able to lay before astronomers a perfect record of the whole phenomenon, which ought at once to solve the question as to the nature of this atmosphere round the sun. Of course a separate plate must be used thus to reproduce each portion of the spectrum in its fullest detail, and the main difficulty will lie in the amount of exposure at his disposal. Ten or twenty seconds were necessary, we believe, to produce the plates showing lines in the red parts of the spectrum which Dr. Vogel forwarded for our inspection; but to produce these he had full sunlight coming through the slit of his spectroscope. At the time of the eclipse, on the other hand, although he was at liberty to expose for three minutes, he had no actual light coming from the orb itself, but only that coming from the halo or corona around the luminary, which, although bright enough, apparently, has

little power compared to the sun itself. Eight seconds, exposure are necessary to give a detailed image of the corona, whereas we know very well that the smallest fraction of a second suffices to impress an image of the sun upon a sensitive plate. The spectrum of the corona will therefore be very weak compared to the spectrum of the sun itself, and we fear lest the three minutes at Dr. Vogel's disposal will be really sufficient to give him an image strong enough for his purpose. However, it is to make the attempt that Dr. Vogel has made a journey of several thousand miles to a tropical climate at the hottest season of the year, and we are only re-echoing the sentiments of every astronomer and photographer in this country when we express a fervent hope that the worthy Professor's labours will be crowned with success.

Allen Young's Polar Expedition.—The Polar Expedition, under Lieutenant Allen Young, of the Royal Naval Reserve, which will accompany H.M. ships the *Alert* and *Discovery*, will comprise a scientific staff of its own, independent of such gentlemen as may be attached to the Government enterprise. A naturalist and a photographer will be included, and already Lieutenant Chermiside, R.E., who accompanied Mr. Leigh Smith in his journey north, and who afterwards read a paper detailing his photographic experiences before the Photographic Society, has been asked for advice on the subject, as also Mr. Baden Pritchard, the War Department photographer. Dry plates are to be chosen for the work, but a small stock of chemicals for the preparation of wet plates will be taken, for in the summer weather the temperature will not interfere with the moist films. There will be probably little for the camera to do, however, for although some bold headlands may be met with, capable of giving good pictures, the stretches of snow and ice-fields, when once reached, may be photographed once as well as a dozen times. The open sea which is said to exist at the North Pole itself would certainly be worth while depicting, and we hope that the expedition will be instrumental in bringing us back some characteristic views of the country in those remote regions.

FRENCH CORRESPONDENCE.

M. LEON VIDAL, who has been in Paris for some days, has obtained a series of well-merited successes during the present week, of which photography will not be slow in profiting. At the Scientific Congress which took place at Sorbonne under the presidency of the Minister of Public Instruction, at the general meeting of the Acclimatization Society, and finally at the last meeting of the French Photographic Society, M. Vidal, who brought with him an album full of specimens of various kinds of his photochromic process, received an enthusiastic reception. The first glance at these striking pictures convinced everybody of the part which the invention is destined one day to play in art, science, and industry.

We have foreseen this success for some time past, but this is not all: photochromy has now arrived at such a degree of perfection that it may be worked on a large scale. Men most competent to do so have passed a favourable judgment upon it, and it is with much pleasure and satisfaction that I can announce that the "Société Anonyme des Publications Périodiques" are now treating with the inventor for practically working the process. This Company has not only considerable relations in Paris and in France, but throughout Europe. Seven journals are published under its auspices, all of which belong to the Company; these are:—"Le Moniteur Universel," "Le Petit Moniteur," "La Petite Prusse," "Le Monde Illustré," "La Presse Illustrée," "La Revue Illustrée de la Mode," and "Le Petit Bulletin du Soldat et du Marin." Besides the above the Company undertakes to publish on commission many other journals, and among others "Le Moniteur de la Photographie." Every day papers and

prints are issued by the Company which may be counted by the hundred thousand, for it possesses printing presses capable of throwing off 24,000 copies per hour. The employés constitute a perfect legion of both sexes, and the Company owns a block of many houses on the Quai Voltaire and Rue de Lille. Photography has a place in its vast establishment, which employs all the graphic processes known; and now photochromy is to find a home here too. All the necessary steps for the installation of the process have been taken so as to work photochromy on an extensive scale, for the Company will not only produce for its own wants, but will execute any commissions it may receive for the pictures, many applications for the prints already existing.

At the same time that M. Vidal arrived, we had the honour of receiving a visit from M. Ernest Boivin, of Mans, who brought with him the models of two photometers of which he is the inventor. It is by reason of their excessive simplicity of construction and mode of working that these apparatus differ from others, and such essential qualities should assure their success. The first is destined for the purpose of regulating the time of exposure when photographing landscapes, &c., by means of dry plates. It is composed of a little plate of mahogany, five centimetres long and three broad, upon one face of which is applied a sheet of black cardboard, which is rather longer than the mahogany, and does not adhere to it completely, so that between the two may be introduced a piece of sensitive paper. Upon the upper face of the mahogany plate is a little opening, circular in form, which is covered with yellow glass, and, if required, may be closed with a very light shutter of copper turning on a pivot. A washer of coloured paper, which occupies about a third of the surface of the yellow glass, and a little disc of a lighter tint placed in the centre, permit the light to pass into the space which remains uncovered between the two; the latter represent the two normal tints which correspond to the necessary exposure for architectural subjects or for landscapes with verdure, &c. When you desire to work with the apparatus, the sensitive paper is introduced, and the cap of the photometer is removed at the same time that the lens is uncovered. As soon as the sensitive paper becomes tinted to the depth of one or other of the normal colours beside it, the lens is capped, and the operator knows that the exposure has been exact, and that on development a good negative will be obtained. With the same piece of sensitive paper many experiments may be made, for it is only necessary to see that a fresh piece is brought under the opening every time a plate is exposed in the camera.

The second photometer of M. Boivin is composed of a rectangular box, the form and size of a tobacco box, and it acts also in a very simple manner. It is destined exclusively for carbon printing; but without a sketch, unfortunately, it would be impossible for me to give your readers an intelligible account of it. I have no doubt, however, it will be promptly manufactured by photographic dealers.

At the last meeting of the Photographic Society on Friday, M. Fleury-Hermagis exhibited what may be truly termed a pocket apparatus for working with dry plates. The camera is composed of four wooden sides connected with hinges, the extremities of which, required to close on one another, are cut to such an angle that when the box is set up it forms a perfect rectangular shape. Folded together, the sides of the camera take up no more room than a cigar case. The little plank which holds the lens and the focussing glass, or frame containing the dry plate, form the ends of the camera. This is mounted upon a three-legged stand, which closes into the form of a walking-stick such as mountain excursionists use.

What is most curious and new in this apparatus is the way of mounting the lens. Instead of being fixed into a tube and worked to and fro with a rack-and-pinion

arrangement, the lens is fitted so as to form a screw of itself, turning in a socket. This is a much more simple arrangement than the ordinary one, and the apparatus may be packed in a closer compass.

M. Hermagis has also designed a very simple means of fixing this very light camera steadily upon the ground on which it stands. A simple card under the camera, which hangs down between the three feet when the apparatus is set up, allows the suspension of a weight, or a stone picked up anywhere, and this is enough to establish the most perfect equilibrium. The plates used with this camera are those prepared by M. Bisson for his portable apparatus, which I have already described in these columns.

At the same meeting, M. Laurent, of Madrid, exhibited to the Society a numerous collection of prints of large dimensions, representing the principal paintings and works of art in the Spanish museums. The pictures were very fine indeed, and comprised an album of great artistic value, which will be of considerable interest to the student of art and history, for the objects are such as should not be allowed to perish. For this reason it is a matter for regret that the reproductions have been printed by the silver process. M. Laurent would have rendered them far more valuable had he printed them in carbon. We are too well acquainted with his skill as a photographer to admit for a moment that he would have found any difficulty in producing prints by the process, which is now placed within reach of all. Fortunately, there is still time, and we hope that in the next edition of his superb work M. Laurent will not pass over the immense advantages which printing in pigments offers, especially in the production of such pictures as these.

The Industrial Exhibition of Exports is in course of organisation at the Palais des Champs Elysées, and is daily acquiring more and more importance. Looked upon rather coldly at the commencement, it betokens at the present day considerable activity. I have already said that photography takes a part in the exhibition, and, according to news that have reached me, it appears that the art will occupy a most important position. Many of our photographers, among whom are our best representatives, have determined to send their productions. I do not hesitate, therefore, to ask the assistance of English photographers in making this a grand exhibition, and they may rest assured that they will receive a cordial reception from their French brethren here. ERNEST LACAN.

MY LATE EXPERIENCE WITH THE WET PROCESS.

BY FREDERICK YORK.*

THE subject I have selected is the old, old story, the management and formulae of our every-day life, which is a subject, I think, we shall have many more years to bother us, although we have been informed on all sides, for the last five years, that the time is not far distant when the silver bath will be a thing of the past. My impression is that many thousand gallons of silver bath will have to be doctored before that time. We see a startling advertisement: "Away with the silver bath, and use dry plates." I am disposed to think this firm's motto is, "Do as I tell you, and not do as I do." This circumstance is pressed home more closely this evening by our friend Mr. Kennett, who is going to show us the future by practical demonstration. This process, like all others, will have to be worked out by some painstaking amateur, for the business man is too much absorbed in other occupations to devote much time to experimenting, unless in a secret process, which seems all the rage at present.

The title I have given to this paper is, "My late experience." I will commence with the glass used. I have

* Read before the South London Photographic Society.

abandoned patent plate, and now use British flatted crown up to 8 by 6, and for larger sizes machine polished sheet, which is a very good substitute for patent plate, at one-third its cost. The process of cleaning is one recently recommended in the photographic journals—to use a paste of whitening or rouge, allowing it to get thoroughly dry on the glass, and then polishing with absolutely dry leathers. I have never once had a streaky plate, which I have often noticed when polishing immediately after using a wet paste, which I used to attribute to dirty cloths or leathers. I have tried albumen in various ways, by coating a wet plate, and applying it to a dry plate; there is such a degree of uncertainty about it that I have discarded it, except to put it round the edges of the glass to keep the collodion from splitting.

There are so many excellent collodions in the market that to give my formula would be superfluous. I iodize a Winchester quart at a time, and always keep one in reserve ripening. When the one in use is empty, I take the ripe collodion into use, and refill the other, which is set aside until required. I find this insures clean work. I am not in the habit of adding additional bromide for particular subjects; I only use one and a quarter grain to the ounce (although three grains are generally recommended). I do not notice any increased advantage, even for interiors; but I notice one great disadvantage—a more rapid deterioration of the silver bath. Those who used to work simply iodized collodion and pyrogallic developer must have noticed that the baths now get out of order much quicker than they did formerly. I remember, when first experimenting with bromo-iodized collodion and iron developer, that I could never get satisfactory pyro negatives from a bath that had been used with collodion containing bromide.

This brings us to the third part of the process, the much maligned silver bath, the source of all our woe, as the late Mr. Rejlander expressed it; many will remember his delighted expression when it was announced that it was to be discarded entirely. The system I have adopted will appear rather troublesome, but to me it is a saving of time. In making a new bath, I always neutralize it with oxide of silver, and put it in the sun, and when filtered add two drops of nitric acid to each pint of twenty ounces. I have four Winchester quarts; I use one a week only, and then pour it into an evaporating dish and boil for a few minutes, to get rid of the spirit; neutralize with oxide of silver, fill up the bottle with distilled water, and add silver to make it up to its original strength of thirty-five grains to the ounce, and put it out to sun. This bath now has a rest, and, when filtered, eight drops of nitric acid are added. I never think of taking a trial plate, so reliable is the plan. At the end of the season they begin to show signs of getting sandy; I then reduce them by Captain Abney's process, and make new baths out of old ones. I am disposed to think that I shall now save myself that trouble, and adopt Mr. Henderson's recommendation of adding nitrate of baryta to a sandy bath, which certainly is most effectual. I have tried it with a useless bath, giving myriads of pinholes, and it had the effect of entirely removing this objection. I was reluctant to adopt it, being a soluble salt. I was in hopes sulphate of baryta would have answered the same purpose, but it does not. I submit plates from the same sandy bath, treated with sulphate and nitrate. You will perceive the sulphate has no effect—the bath is the same as before; but with the nitrate the objection is entirely removed.*

I am not able to explain its action, and trust it will provoke a discussion, that we may know the chemical

effects of this most useful adjunct to the photographic laboratory. I do not think we have yet arrived at the cause of a sandy bath. We naturally conclude it is from excess of iodide, as it seldom shows itself until the bath has been in use some time. My own impression is that it is not iodide; for the crystals found adhering to the sides of the bath and bottle are insoluble in a solution of iodide of potassium. The precipitate formed by the addition of nitrate of baryta is not affected by exposure to sunlight. And again, I have strengthened an old bath, working well, and the next day the plates have been covered with myriads of pinholes. I am anxious to know why this occurs, because it is opposed to the theory of supersaturation. Strengthening a bath ought to retard, and not facilitate, this change. I hope our worthy vice-president, Mr. Spiller, will be able to enlighten us a little on this most important subject.

I have very little to add respecting the use of the bath. I find that in taking interiors the plates are better for being only a short time in the bath—just sufficiently long to remove greasy lines—and then well aired, by resting on the dipper, and finally re-dipping two or three times in the bath. It is also very important, in order to prevent stains, to pack it well with blotting-paper, to absorb all the superfluous solution. I am rather extravagant in its use, as it preserves the carriers and clothes, and prevents stains where working. The following incident occurred at the Albert Memorial in 1872, when the place was swarming with photographers. I always worked there very early—in fact the earliest—and the police in charge made me clean up all the stains made by others the day previous, before allowing me to commence.

We are now arrived at the development. This is a subject I have given great attention to. My experience is at variance with many eminent men. I prefer simply sulphate of iron, and with a small quantity of acetic acid. My plan is to make it in a concentrated form, so that one drachm mixed with seven of water makes an ounce of developer. The advantages are, simplicity in mixing as required, and uniform action; for it has undergone the process called ripening, which many regard as valuable for clean pictures. The proportions are:—

Water	...	...	...	...	...	3 parts
Acetic acid	...	...	...	...	...	1 part
Saturated solution of sulphate of iron	...	...	...	...	...	4 parts

In summer I use one drachm in the ounce, but for interiors, and in cold weather, I use two drachms in the ounce, spirits of wine, *quantum suff.* The proportions of this developer are about twelve grains of sulphate of iron, seven drops of glacial acetic acid, to the ounce of water. I prefer using distilled or boiled water, or water in which a few grains of nitrate of silver to the gallon have been added, as I have traced pinholes, similar to a sandy bath, to hard water; for after development I still use pyrogallic and citric acid before fixing, and acetic pyro after fixing. In the latter case, I always flood the plate with iodine, to prevent stains, which occur very frequently if not thoroughly washed after fixing. It is most important to use a dilute solution of cyanide after intensifying with acetic pyro, or the negatives will, in time, turn brown, and get so dense that they are useless. I always use cyanide for fixing, as I am reluctant to carry about hypo.

In conclusion, I should like to call your attention to the most perfect non-actinic glass I have ever met with. It is prepared from an alcoholic solution of aurine mixed with collodion, the glass coated in the ordinary way, and afterwards varnished with diluted carriage varnish. I did not get favourable results by dissolving aurine in spirit varnish; the results were not transparent.

The principal object of this paper is not to advance any crotchets of my own, but to touch on subjects with which we are all familiar, hoping to provoke an interesting and profitable discussion.

* In a note written since the meeting, Mr. York gives us the following details:—"I found that five grains to the ounce answered for the old bath I experimented with. I tried smaller quantities, but found, after filtering, that the addition of more nitrate caused a further precipitate, which ceased after five grains were added. I did not use the bath between each addition. It is possible that a much smaller quantity may be used."—Ed.

A NEW DRYING BOX FOR DRY PLATES.

BY W. DALLAS.*

THE apparatus consists of a box (A, figs. 1 and 2), in length two feet, eighteen inches in width, and one foot in depth, with a loose lid. One of the long sides is divided about one-third from the top, the parts being hinged together. On a level with these hinges is a glass plate (*a b*) extending nearly the length of the box, and so as to

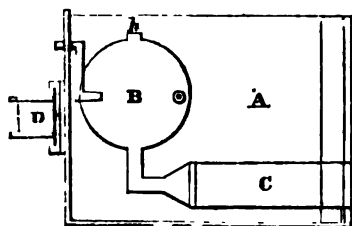


Fig. 1.



Fig. 3.

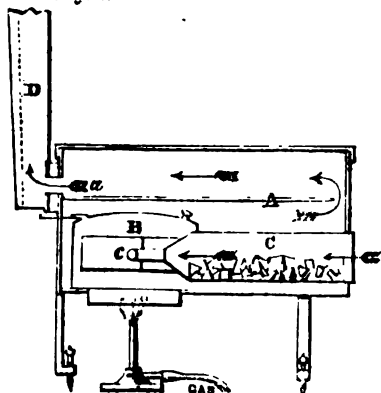


Fig. 2.

leave a communication between the upper and lower compartments, into which the interior is thus divided. Heat is applied through a closed boiler, B, ten inches in diameter and six inches deep; in this is suspended an air-vessel (*c*), eight inches in diameter and about two in depth, the interior of which is partially divided by three partitions, *d, e, f*, as seen in fig. 3. One end of the air-vessel communicates with a cylinder (*C*) fourteen inches long and four inches in diameter, in which is placed any hygroscopic substance—such as quicklime—and this cylinder projects beyond the end of the box. At the other end of the box is a chimney (*D*) communicating with the upper chamber. The whole is supported on levelling screws, for the purpose of adjusting the table, *a b*, upon which the plates to be dried are laid.

The action of the whole is, that the air entering through the cylinder *C* becomes more or less dried, and in making its way through the air-vessel *c* the temperature is raised; on entering the lower chamber at *k* it becomes further heated by contact with the hot surface of the boiler. The air then passes into the upper chamber, and in its progress towards the chimney will dry anything it meets upon the shelf *a b*. The passage of the air may be traced by the arrows in the figures. The apparatus easily raises the temperature inside the box 60° above that of the external air. Should greater heat be required, the waste steam may be rendered available by passing it through any length of tin tubing.

ON THE AID WHICH PHOTOGRAPHY HAS RENDERED TO THE FINE ARTS.

BY ALEXANDER HUNTER, M.D.*

WHEN photography was first discovered it was thought that it would eventually rival, if it did not supersede, the fine arts. This it will never do, for several reasons: first, from the limited size; second, the texture or surface of the

materials employed; and third, from the deficiency in colour and in *pasto*. It may be objected, that photography has not yet had time to be thoroughly perfected and developed, as it is really only an invention of the last half century; while painting, drawing, fresco, modelling, sculpture, architecture, and ornament, with all their multifarious applications and combinations, have been known, practised, and nearly all perfected to a very great extent, nearly two thousand years ago, and some of the fine arts have an undoubted antiquity of three thousand years, for if you search through the marginal references of your Bible, you will find that 1045 years before our Christian era, David and Hiram were employed in collecting materials for the building and decorating of the Temple, which was commenced a.c. 1015, and completed in eleven years—modelling, chasing in metals, embroidery, and carving in wood, having all been brought into use for the perfecting of this grand Temple. Shortly after this period, or about 862 a.c., we find that architecture, sculpture in stone, and casting in metals, were brought to considerable perfection in Nineveh, when Jonah was sent to preach repentance. Then at a later date, or 580 a.c., we find Nebuchadnezzar setting up a golden image (see Daniel iii. 1) ninety feet in height; and from this period to the second or third century of our era the fine arts appear to have been brought to great perfection in Egypt, Greece, and Italy. I need not enter into further particulars regarding their relative ages, for we have abundant proofs that the fine arts were known, practised, and encouraged, many centuries before photography was ever thought of. Almost every year brings to light new discoveries relating to photography, which prove that as a science it is not yet perfected, while as an aid to the fine and industrial arts there is hardly any limit to its applications; and we must all admit that there is not one branch of art or of industry to which it has been applied that has not materially benefited by its use.

If we take a glance at some of the multitudinous applications of photography, we find that although artists are greatly indebted to photography for multiplying, cheapening, and preserving truthful records of what has been done in art, still there are limits or bounds to its usefulness, and, in a few instances, defects which will probably never be overcome; though, even in hazarding a statement of this kind, it may be safer to say that up to this period the following appear to us to be the limits of its utility, and the defects of photography. The members of this Society will perhaps be startled to hear me talk of the limits and the defects of the science, but there is no question that we are running into a few dangerous and questionable applications—as, for instance, the attempt to produce life-size portraits upon paper, believing that these will bear favourable comparison with nature, or with portraits painted in oil with the hand, drawn with chalk, crayons, or water-colours, or sculptured in marble. The very nature of the materials with which we work shows us at once one of their serious defects, for these life-size portraits always suggest the idea of the sitter being pachydermatous—thick and coarse-skinned—or that he or she has lately recovered from a severe attack of small-pox. Here, then, is one of the limits which ought to be placed upon the practice of photography. Do not attempt a portrait or figure above one-third of the size of life, for, independently of the roughness of texture, there is a feebleness in the light and shade, and often a commonplace vulgarity or vacancy of expression, which are exaggerated by being magnified.

But there is another extreme which is equally vicious, degrading, and commonplace in photographic portraiture, and this is the wretched small cheap and nasty *cartes-de-visite*, where the face is about the size of a pea, and where the art of the tailor, dressmaker, bootmaker, or hatter are obtrusively conspicuous, or where one-third of the picture is perhaps occupied by a table or a drawing-room chair, with vulgar spiral or commonplace turnery, that detracts from instead of improving the picture. I do not condemn all *cartes-de-visite*, but I think most people now prefer

* Read before the Edinburgh Photographic Society.

likenesses of their friends of a better description, and are content to have the head of a larger size, if it be truthful. This also admits of more artistic taste, and photographic portraiture now finds favour with nearly all classes, and its results are often artistic and highly satisfactory.

There is one peculiarity about some lenses, however, that ought to be noticed, and this is, that they frequently dwarf a tall figure. The same defect is also to be traced in landscape photography, especially when applied to gigantic hill scenery, hills being almost invariably dwarfed.

Having pointed out some of the defects in photography, we come now to the grandest and most legitimate of its applications. This, however, embraces a wide field, for it means the representation of nature in all its most tasteful, pleasing, and instructive aspects. Now this is the great difficulty with which all photographers have had to contend, for nature is often very beautiful and pleasing, though many of her beauties are evanescent, or so subtle and transitory that it is only when we attempt to fix them in the camera that we find how miserably we often fail.

But it is necessary to classify the objects of nature before we can lay down any fixed rules for representing them, for this is the very point in which the fine arts have the advantage of photography. Animate or living nature is unquestionably more difficult to represent than inanimate or still life, as it is called by artists, and it is for this reason much of the beauty of life, whether in human beings, animals, or birds, depends upon action, movement, or sentiment. Now when we try to catch or stop this, as we almost invariably do, in the camera (for to take a good photograph we must have a certain amount of perfect quiet or repose) we are apt to substitute a pause in the action for that natural grace which generally gives the charm to that action which has pleased us. Hence the cause of many of our failures in catching expression, life, or action. The artist has the advantage of the photographer in this respect, that he can portray action and emotion, and has the power to represent them under sudden violent or tender aspects, which in photography are apt to degenerate into attitude posed, or gesticulation. Emotions, again, are liable to be either insipid or overdone, and to border upon caricature in photography. Much, however, depends upon the taste, skill, and judgment, of the artist or the photographer, and he will be the most likely to succeed who has studied both nature and the fine arts, for fixed rules cannot be laid down for the application of taste, and, unfortunately, so rare a gift is it, that it is very questionable if it can ever be taught or imparted. Sir Joshua Reynolds' reply to the lady who wished her son to be taught to paint with taste was pithy and laconic: "That, madam, is a matter of brains." Gently tapping his forehead with his forefinger, the president politely bowed the lady and her son out of his studio.

(To be continued.)

POTASSIC PERMANGANATE AS AN INTENSIFIER.

BY W. H. DAVIES.*

THIS question has been again brought under discussion, in consequence of some remarks made by me in a paper read before this Society at a late meeting, in which I characterized the method of intensifying with permanganate of potash as unstable. This remark has been called in question, both at the time of publication and since, by the Editor of the News, Dr. Vogel, and others who hold such positions that what they say must be considered and replied to. In all matters of dispute, the questions at issue must be settled by evidence; therefore a detail of my experiences with permanganate as a toning as well as an intensifying agent may aid in settlement of the case.

Some years ago I was engaged in getting up a lot of transparencies, and being desirous of giving them a rich golden brown tone, I experimented with a considerable

number of toning agents, including gold, iridium and gold, platinum, palladium, &c., and finally got pretty near what I wanted in permanganate of potash. The colour was all I desired, and although not completely under control as to uniformity of tint, it was, in this respect at least, as sure as any of the others. Another quality it has for this purpose is the clearing up of the transparent parts of the pictures. After a time I began to suspect that the colour of the transparencies was slowly but gradually changing, and I set to work to find whether this was so or not, and the why and wherefore thereof. A pair of test pictures were made, one of which was varnished, the other left unvarnished; these were exposed freely to light and air, being placed up against the window of the glass house, accompanied by another varnished one, which had been gold toned. The whole of these were wet collodion plates, and as a test another was made and treated precisely as the two first, but varnished and kept away from light, air, and variations of temperature, as far as that was possible to be done. The lapse of a very few months sufficed to show that the first pair of pictures had sensibly deteriorated in colour and quality, while the gold toned picture had not changed at all, or, if so, then it was so little as to be unobserved. The ratios of deterioration were greatest with the unvarnished plate, next with the varnished one, and least with that which had been shielded from light and air. This deterioration has gone on steadily ever since, until now the one unprotected by varnish is a mere shadow of its former self. This would have been tolerably good proof in most cases, but, fortunately or unfortunately, I was destined to receive a much more sudden and, at the same time, absolutely certain proof of the instability of the permanganate as an intensifying and toning agent.

On the occasion of the marriage of the Duke and Duchess of Edinburgh, about a year ago, I was asked to make the two life-size transparencies of the royal couple on about thirty by twenty inch plates, which I did by the ordinary wet process, and finished them by what I then thought the finest method I had yet hit upon; such delicate brown tints were equalled only by the best mezzotints after Sir Joshua Reynolds; and in doing them I thought I had not only discovered "a thing of beauty," but that it would be a "joy for ever." Alas, alas! I had not to wait a year, a month, a week, a day—no, only a single night—ere the beauty was flown for ever: the exquisite transparency of to-day became, under the influence of burning gas and the heat generated, merely a hopelessly, helplessly ugly combination of superoxide of manganese on a silver basis, together with the added products formed by four hours' combustion of good Edinburgh coal gas of twenty-eight candles' value; and what that may produce, who can judge? The examples are before you, and you can see for yourselves how they have been destroyed, and you see, also, that these two samples have faded in spite of the varnishing.

I have not taken especial care over these examples of the failure of the per-(no—the super-)oxide of manganese as a stable intensifier of the silver image. It may be said that these experiences are of transparencies only. This I admit; but we all know that the conditions under which the respective images of the negative and the transparencies are produced are identical, both being made by the wet process; so that what holds in one case would also hold in the other.

There cannot be a doubt that varnish, and complete exclusion from light and air, do to a certain extent preserve the film of manganated silver, as in the examples I now show, which are prepared in the same way, and varnished, rendered air-tight, and, to a great extent, kept in the dark, except when in use in the lantern. These seem to have undergone no deterioration whatever; but that, I submit, is no proof of the stability of the permanganate as an intensifier. I may mention that I have another pair of test examples presently undergoing trial, on which, some months hence, I will bring up a further report.

* Read before the Edinburgh Photographic Society.

The Photographic News.

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A VERY SIMPLE AND EFFICIENT ENLARGING PROCESS.

A VERY curious illustration of the fact to which we have more than once recently adverted, that much valuable matter lies entombed in the journals, comparatively unproductive, for the want of enterprise on the part of some skilled worker to carry the processes indicated from the point at which they had been left by the experimentalist to their highest practical issues; and an illustration further of the independent discovery or re-discovery of a method identical with one of those processes published long ago without fructifying, was recently furnished. The method of enlarging described by Mr. Blanchard at the Photographic Society on Tuesday evening is, we venture to say, one of the most simple and efficient in existence; and the examples with which he illustrated its capabilities were amongst the finest enlargements we have ever seen. We may go further, and affirm that we have rarely seen landscapes taken direct equal them in some of the highest and most valuable pictorial qualities. The process with Mr. Blanchard is, beyond a question, an original one, and yet it is a process we ourselves worked out and published years ago. It is about fifteen years since we first attempted the process, and a few years subsequently we worked it out and described it in the *NEWS*. When the question of enlarging was brought again prominently before the public three or four years ago, we were again reminded of the method in question, and we published it in the *YEAR-BOOK* for 1872. As the article is brief, and contains some suggestions of interest, we reproduce it on another page. Fortunately for the photographic public, Mr. Blanchard hit independently upon the same idea, and has worked it out to a degree of perfection for which we should scarcely have hoped, and to which, in our experimental efforts, we certainly never attained. We say fortunately, because it is so in a double sense: first, because his skill has so fully shown the capabilities of the process; and, second, because, with his characteristic liberality, he gives the results of his experience freely to his photographic brethren. On ascertaining that it had been already published, Mr. Blanchard at once abandoned the notion of bringing the method before photographers as a novelty, and it was only at our urgent solicitation that he consented to place before the Photographic Society a process and illustrations for which we feel certain every one present was grateful.

The process briefly stated is as follows:—An enlarged transparency of the full size of the required print is obtained from the negative by the ordinary wet process. This transparency must be as perfect as it is possible to produce it, for all the prints finally obtained should be facsimiles of the transparency. Slight retouching may, if necessary,

be effected on the transparency, but with a good negative this should not be necessary. From this enlarged transparency a print is obtained on albumenized paper by the ordinary method of printing in the pressure frame; and this print is the enlarged negative from which all subsequent prints are to be produced. It is important, therefore, that it be a good print in all respects, clean, sharp, and vigorous. It need not be toned, but simply fixed, and well washed. It is touched as may be required; then waxed to render it transparent, and is straightway ready for printing.

Many of the advantages of such a process are obvious; but there are some not quite so apparent until they have been considered. We shall, therefore, briefly summarize some of the most important advantages.

The process is simple and easy, involving no operations unfamiliar to photographers generally.

The negatives are not fragile, and are easily kept in stock.

The negatives are easily retouched with either pencil, stump, or water colour.

Where large numbers are required, nothing is more easy than to produce a number of negatives by printing from the transparency, and so print from a score of negatives instead of one or two.

The negatives can be printed at either side, either direct or reversed.

Paper negatives present the most admirable facilities for double printing, either in such simple form as the introduction of a background to a portrait or a sky to a landscape, or the more elaborate work of producing combination groups and similar compositions. If the ordinary methods of masking be employed, paper negatives facilitate the operation; but they present also additional facilities in the possibility of neatly cutting up and joining the various negatives, attaching the portions to a plate of glass, and producing one combined negative for printing at one operation, rather than printing portions of a series of masked negatives in successive operations, with all the care necessary for perfect junction at every printing.

Paper negatives, moreover, possess a beauty essentially their own, and yield prints with a specific texture which generally pleases the artistic eye. The texture need not be either coarse or granular; but it often gives a soft, delicate, atmospheric quality rarely otherwise attained. The examples showed by Mr. Blanchard on Tuesday night were chiefly landscapes produced from stereoscopic negatives, enlarged to sixteen inches by twelve. Without any lack of sharpness or crispness of definition, they all possessed that soft, delicate, painting-like quality which at once charms the artistic eye. In some cases, where the taste has been educated only on photographs, the observer may miss the hard wiry incisive line which charms the technical microscopic eye and disgusts the cultivated artist; but we imagine that few examined the specimens by which Mr. Blanchard's paper was illustrated without echoing the general sentiment that whilst they surpassed by far the greater majority of enlargements, they had rarely been equalled in pictorial qualities by prints taken from negatives direct in the camera.

A FEW MORE WORDS ABOUT DRIED ALBUMEN.

A FURTHER examination of the dried albumen to which we referred in our last impresses us more strongly with the numerous advantages it presents, not simply on the score of excellence, but also as a matter of economy and convenience, especially to amateurs—and, indeed, for photographers generally—for except in the preparation of albumenized paper the photographic consumption of albumen is rarely large. The chief use of albumen in the operating room is for employment in preliminary coatings, and in the preservatives employed in many dry plate processes. A

very common form of failure with beginners in applying albumen to both purposes arises from the albumen being imperfectly liquefied by beating, slight filaments in the albumen solution causing streaks in the plates. The dried albumen before us gives a perfectly clean limpid solution, and by its use defects from such a cause become impossible. Frequent failures arise from the temptation to use a solution which has been kept for a time, and which does not seem so palpably deteriorated as to make its condemnation certain. The use, therefore, of a preparation which renders failure from defective albumen impossible is, manifestly, an economical proceeding.

There is, moreover, inevitable waste in preparing white of egg for use at all times. Besides the risk of occasional bad eggs, and the waste necessary in removing the germ from impregnated eggs, there is always considerable waste in preparing a small quantity of any viscous solution, from the mode in which it clings to the sides of vessels and other apparatus used in preparing it. If the whole quantity prepared for use be not consumed, it is not a pleasant thing to keep in stock, being apt to decompose and cause both stench and waste. The advantage of being able to prepare any quantity from a drachm to a pint, of any strength which may be required, and have it ready for use at a few minutes' notice, is a gain in convenience and economy which cannot very well be overrated. The dried sample before us is a really elegant preparation: clear, bright, and sweet, it dissolves in cold water in a few minutes, without residue, giving a bright limpid solution ready for use at once. Even in the small bottles, in which it is sold at the rate of one shilling and sixpence per ounce, it is not a dear article; but as it is sold in quantities of eight ounces and upwards at the rate of one shilling per ounce, it becomes very cheap indeed, and absolutely more economical than fresh eggs to the ordinary consumer. Mr. Thomas considers one ounce to be equal to the whites of seven eggs; but as there is the inevitable waste to which we have referred in preparing fresh albumen, it is easy to understand that, as a practical fact, one ounce furnishes more solution than the whites of seven eggs, and confirms Captain Abney's experience, to the effect that one ounce of dried albumen is more nearly equal to the whites of ten eggs, giving ten ounces of solution of the consistency of fresh albumen. We feel, therefore, that we are doing numerous readers a valuable service in placing forcibly before them the advantages in cleanliness, convenience, economy, and freedom from risk, waste, and annoyance, which this admirable preparation places in their hands.

PHOTO-MECHANICAL PROCESSES IN COMMERCE.

THERE cannot be a doubt that an extensive opening exists in this country for the commercial application of photo-mechanical printing processes. For some singular reason, whilst we constantly learn from printers and publishers that they would gladly avail themselves of any good photographic process applicable to ordinary press printing, we also as constantly learn from gentlemen associated with photographic experiment in this direction that they have processes in every way perfect, and awaiting a fair chance of introduction, yet very little seems to be done. In America greater progress appears to have been made, and a daily newspaper, the *Graphic*, is illustrated by a process in which photography plays the initial part. In this country the Woodbury process appears to be most extensively used for publication purposes; but the results which have come under attention lately have frequently been unequal and imperfect. Photo-collographic processes have also been used to a moderate extent; but, from all accounts, with equal uncertainty. Another photographic process, employed as an aid in illustrating a popular periodical, has, we have been recently informed, been given up, as more trouble

than hand-drawing. And photo-block printing processes have hitherto failed to obtain any accepted position in the printing trade. Perhaps the most interesting application of photography in this direction is the use to which it is applied on *Punch*. The charming illustrations by Du Maurier are drawn by the artist, on account of some disabilities of eyesight, on a very much larger scale than they are printed. They are then reduced and placed on wood by means of photography; but the engraver is employed, as usual, in the cutting of the block.

The most successful of the block-printing processes produced by photographic means is that to which the inventor has given his own name, calling it Dallastype. Being a secret process, only worked by the inventor, its application has necessarily been limited, and the tests of its capability have necessarily been as limited; but some very excellent work has been produced by Mr. Dallas himself. A proposal to dispose of the secret for a sum to be raised by the subscription of a number of photographers has recently been issued by the inventor. The aggregate price demanded will probably startle many; but it is argued that as the cost to each individual will not be large, and as the process is the result of a lifetime of experiment and study, the large total should not be considered exorbitant. This is not, however, a point for us to discuss; we merely in the interests of our readers place the details briefly before them. The process is offered to five hundred or more subscribers at £20 each, making a minimum sum of £10,000. The names of subscribers will be received up to the end of September next, and, we presume, no sale will be effected unless the number reaches five hundred. When the total number of subscribers have been received, and the money paid, each subscriber will receive a printed copy of "Directions" for work, and for a guinea extra may see the process worked, or for five guineas more may receive three lessons. The subscribers will not be pledged to secrecy, each one dealing as to him may seem best with the knowledge he has purchased.

The proposal is, doubtless, a novel one, but it is carefully stated, and various reasons given for the mode adopted in carrying out the project, the document in which the matter is set forth occupying four closely printed pages of post folio. Those interested in the question should carefully read the proposal in detail.

PAPER NEGATIVES FOR ENLARGED PHOTOGRAPHS.

THE following description of a very simple method of enlargement, referred to on another page, appeared in our YEAR-BOOK for 1872:—

"The simplest method of producing paper negatives with which we are acquainted is one we have often practised with success. It consists, first, in producing from the small negative, a good, vigorous, well-exposed, enlarged transparency of the size desired. This is easily effected without extensive or expensive appliances: a small room—the ordinary dark room will often answer—which can be made dark; a hole in the shutter to admit of the negative; a good card lens; and a screen upon which to rest the sensitive plate: the appliances, in short, which we have before described for producing the transparencies for Sarony's photo-crayons. Thus equipped, without large camera or lens, the large transparency can easily be produced. From this it is simply necessary to produce the negative on paper by contact printing. We have found that a piece of albumenized paper, immersed in the bath instead of floating, plain side in contact with cliché, printed deeply, and fixed without toning, would generally give a negative of sufficient printing vigour, admirably suited for working upon, the highest lights being applied by the pencil. Where sufficient vigour is not obtained by printing out, development printing may be adopted, the ordinary calotype formula being used, and a few seconds

only of exposure in the printing-frame. We have found also that paper prepared with fluoride of silver, printed until a slight image appeared, and then developed with gallic acid, gave an image of fine non-actinic colour, well suited for printing purposes. The paper negative, after finishing and touching, should, of course, be waxed, to render the paper transparent, in the manner generally employed in the calotype process."

Correspondence.

TOUGHENED LENSES.

DEAR SIR,—As it is probable M. de la Bastie's grand discovery of a method of toughening glass without destroying its transparency contributes also to a great increase of density, it has occurred to me to throw out a hint to our friends the opticians to examine the matter with a view to practical applications in their line.

It would be interesting first of all to know the indices of refraction of toughened crown and flint glass. This could soon be determined. The non-liability to fracture in a lens, though very important, is of little value compared with improved optical qualities. I should say very few valuable lenses get broken. Still it will be an advantage to have a lens not easily injured.—I am, dear sir, yours truly,

363, Gray's Inn Road, April 10. DUNCAN C. DALLAS.

PROPORTIONS OF LANDSCAPE PHOTOGRAPHS.

DEAR SIR,—As a subscriber to your valuable journal, and being myself a landscape and animal painter, besides a portraitist, perhaps you will kindly allow me a little space to call the attention of my photographic brethren to the great discrepancy that there is between the size of enlargements made, and the canvases that are sold by the well-known firms of Newman, Windsor and Newton, Reeves and Son, Rowney and Co., &c. The subjoined list gives the photographic enlarger's sizes and the artist colourman's, and by it your readers will be able to judge that the photographer makes no distinction at all, which there should be, between the human portrait and that of animals—say mounted equestrian portraits, for instance. The thanks of artists generally are due to Mr. Faulkner for calling special attention to this subject, and it would save a great amount of inconvenience both to the artist and the enlarger if the latter would have a list prepared with sizes special for animal and landscape subjects. An artist who thoroughly understood his business would never think of using a 24×18 in canvas for a portrait, or a 24×20 for an animal picture.

The Enlarger's Sizes.

Portrait

Inches.

10×8

12×10

15×12

20×14

22×17

23×18

25×20

27×22

30×25

34×26

36×28

40×28

44×34

50×40

72×54

The Artist Colourman's Sizes.

Portrait.

Inches.

8×6

10×8

12×10

14×12

18×14

20×16

21×17

24×20

30×25

36×28

41×24

50×40

56×44

88×56

94×58

106×70

Landscape.

Inches.

9×6

10×7

12×8

12×9

13×9

14×10

15×11

16×12

17×13

18×12

19×13

21×14

22×16

24×18

27×20

30×20

36×24

I will just mention this, that a negative has been taken of a lady mounted on horseback, and she wishes it to be reproduced in oil colours, with the special proviso that the size of the picture without the frame is not to be more than

21 by 14 inches. The artist who receives the commission can at once obtain canvas measuring that, but he cannot obtain an enlargement from a photograph of that size, the nearest approach to it being 20 by 16 inches. Now the enlarger will say that the last named size is correct; and so it is for human portraiture, but not for animal as well. I see among the photographs lately registered that there are some of a particular hunt. Now it would be almost absurd to enlarge one of these negatives for the purpose of painting a picture in oil, or even water colour, of it, and make it the same proportionate scale that you would a life-size head and bust.

Each succeeding year photography is more largely employed by artists, and therefore, for their better convenience, it is to be hoped that the photographic enlarger will issue a different scale of sizes, and not mix up indiscriminately human portraiture with either animal or landscape size.—I am, dear sir, yours faithfully, GEORGE CECIL HANCE.

Jarrow-on-Tyne, Durham, April 12th.

SIZE AND PROPORTION IN PORTRAITURE.

SIR,—Permit me to explain that I apply the term "lanky" to the boudoir size *only* when it is used for other description of portrait than the whole-length, the especial size for which it was designed by Valentine Blanchard. In talking with him on the subject, I said: "The introduction of a new size which is only adapted for one description of portrait cannot but have a baneful influence upon photography for many reasons—chiefly, the difficulty most people experience in standing naturally during the length of exposure necessary in our miserable light; the few photographers who possess sufficient knowledge or skill to make a presentable whole-length picture; the dearth of natural, sensible, or pictorial accessories; the absolute absence of properly painted backgrounds. These considerations will in a short time compel the great mass of photographers to abandon the whole-length altogether, and take refuge in half-length or three-quarter pictures, for which your new size is unsuited. Then publishers will ruthlessly cut down all photographs from 15 by 10 to 8½ by 6½ the Boudoir size, regardless of proportion or effect. Manufacturers will play their usual pranks with it, alter the size in every way, make the top arch or elliptical shaped, absurdly round off the four corners—in fact, every conceivable bad alteration will be made."

Already some of my anticipations have been realized. I saw, for instance, a large figure, which I presume was originally 15 by 12, thrust into the Boudoir size; the head was one-sixteenth of an inch from the top of the picture. Permit me again to say, "Proportion is the basis of beauty," and to refer to the proportions of the canvases employed by the old painters, which, I submit, ought unhesitatingly to be adopted for photographic portraits.

I would ask the manufacturers to consider the height of a man in proportion to his width. If it is necessary to have 7ft. 10in. by 4ft. 10in. to represent a whole-length, surely a different and squarer size ought to be used when, instead of six feet of length, we have only two feet to represent. Reason, good taste, the teaching of all writers on art, and the works of all great artists, teach this. Ignorance, custom, prejudice, and a mistaken greed of gain are against it.

From personal knowledge and experience, I know how solicitous artists are with regard to the proportion of their pictures, and rightly so; for it is the true proportion of a picture—that is to say, its width with regard to its length—which enables an artist to make an excellent composition. It is the necessary width which affords him the space to give breadth and solidity to his picture; which permits him to balance his masses of light and shadow; contrast, support, or carry out, the lines of his figure; in fact, proportionate width is an absolute necessity to a fine composition. The late William Eass, the eminent enamel painter, once told me that Sir Thomas Lawrence altered the size and propor-

tion of a half-length picture six times before he pleased himself. My father, who also knew Sir Thomas, confirmed this by saying he had seen him add or take away a quarter of an inch from a large picture. Anyone not wilfully blind would admit the importance of proportion if they troubled themselves to think on the subject, or would take a whole-length engraving from a great picture, and proceed to cut it down to half-length or head size, as is done by publishers and manufacturers to photographs. It is not a little strange that while the size of the glass employed in making negatives is in every case good, the finished result is false in symmetry and proportion, due to the malign influence of makers of frames and albums. I ask, how long will photographers tamely submit to this dictation? That a good album with three sizes would be a commercial success I have personal evidence and experience.

Many years ago, disgusted to see my pictures mutilated, and the very part cut off on which I had bestowed my best efforts—viz., the width—I had twenty-five albums made, with three carte-de-visite openings or mounts, proportioned to give the pictures the utmost importance. The first copy I forwarded to you as Editor, and you did me the honour of describing the album in your journal in most favourable terms. Encouraged by your approval, I submitted my album filled with pictures to three of the photographers most esteemed by the public at that particular time. One and all approved: one and all gave mean and sordid reasons for not joining me in my effort to introduce a good and sensible album. Placed on a table in my reception room, it attracted the attention of the first man of taste who called on me, who immediately wished to purchase a similar album. In this way twenty were soon disposed of, and the purchasers, finding it difficult to fill up the spaces, applied to me to supply them with my prettiest pictures.

For years I felt the favourable influence of those albums. For years afterwards people came to sit to me, in consequence of seeing them. At the same time I induced a manufacturer to supply me with toned cards. He warned me against them: "they would not be liked," &c., &c. But from the moment of their introduction to the present time I have scarcely seen a white mounting card.

I mention these instances to show that a good thing is only to be seen to be appreciated by those of cultivated taste, and they influence the mass sooner or later.—I have the honour to be, sir, your obedient servant,

ROBERT FAULKNER.

BRONZE CASTINGS OF PHOTO-BAS-RELIEFS.

SIR,—Having experimented successfully with a photographic process that gives bas-relief, I wish to reproduce them in bronze. Can you or any of your readers kindly inform me how I can melt copper, tin, &c., on a small scale for the bronze castings?
P. M.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual monthly meeting of this Society was held in the Conduit Street Gallery on the evening of Tuesday, April 13th, Mr. J. GLAISHER, F.R.S., in the chair. The minutes of a previous meeting were read and confirmed, and Captain Horatio Ross was elected a member of the Society.

Mr. VALENTINE BLANCHARD read a paper on a new method of enlargement, which will appear in our next. He exhibited some enlarged glass transparencies from stereo negatives, a number of very fine paper negatives made from them, and a selection of exceedingly perfect prints, which were much admired.

The CHAIRMAN, referring to the charms of paper negatives, said he recently examined some calotype negatives he made thirty years ago, and found them as perfect as when first produced; the wax preserved them, and gave them a quality almost like talc.

CAPTAIN ABNEY said that Mr. Blanchard had some time ago told him of this method. At that time he was pursuing a somewhat similar plan, but using dry plates for the negatives. He at once adopted paper, and was perfectly satisfied with the results, which were as good as collodion negatives. He might mention that, in waxing the negatives, it was a good plan first to wax the blotting paper.

The CHAIRMAN said he used to employ a tin dish in waxing the negatives.

Mr. BLANCHARD, in answer to a question, said he had generally used albumenized paper for the negatives, but for some he had used a plain paper prepared for him by Mr. Thomas, who added, he believed, a little albumen to the salting solution.

Mr. HUGHES remarked that all the specimens were landscapes, and asked if the process gave equally good results in portraits.

Mr. BLANCHARD explained that all the specimens were produced two years ago, and he had been so much otherwise engaged since that he had not had time to produce others; but he might say that portraits so produced were even finer than landscapes. He might explain here that the process really was not, it seemed, a new one, but had been described in the YEAR-BOOK some years ago, as he had recently been informed by his friend Mr. Wharton Simpson. He was not before aware of that, but believed it to be original; if he had known, he might probably not have worked it out under the impression that it was new. On learning that it had been published, he gave up the thoughts of reading a paper; but Captain Abney and Mr. Wharton Simpson had so strongly urged him, he consented to read the paper they had heard.

Mr. W. NOEL HARTLEY asked if Mr. Blanchard had used solid paraffine in place of wax. It was, he thought, better, as being more transparent.

Mr. BLANCHARD had not tried it.

A MEMBER said he tried the recently proposed mixture of castor oil and alcohol, and found it answer well.

CAPTAIN ABNEY thought it would not answer so well in printing.

A vote of thanks was passed by acclamation.

Mr. J. R. SAWYER then read a paper describing improvements in double transfer carbon printing, which will appear in our next. The special improvement consisted, as was shown in an interesting demonstration, in the use of a flexible support for the print during development. He (Mr. Sawyer) had been led to the conviction that some of the defects of texture in carbon prints by Mr. Johnson's method were due to the fact that the expanding surface of the pigmented gelatine was held firm by the rigid body with which it was in contact, and he had prepared a paper the surface of which, although it was made impervious to moisture by means of a coating of insoluble gelatine followed by a solution of lac in borax, was still sufficiently elastic to avoid the defects produced by a rigid surface. A number of very fine examples were exhibited.

A conversation followed, in the course of which

Mr. BLANCHARD explained that he had been able to secure a fine surface on carbon prints by the use of Weston's Burnisher, but it was imperative that the prints should be dried by the fire immediately before burnishing, otherwise the gelatine image was so greedy of water that it absorbed damp from the atmosphere and rendered burnishing impossible. The effect in giving transparency, detail, and richness to the shadows was marvellous, and made the prints rival the finest on albumenized paper.

Mr. HOOPER, whilst admiring the results and the promised permanency, could not but think that the future of permanent photography, at least for small pictures, did not rest in carbon printing. The process had been before photographers now for ten years, and time after time improvements were made and brought before them; but still photographers did not take it up. There must be a reason, and, apart from the complications of the process, he could not but think that it was due to the fact that in small pictures, at least, the results were inferior to silver printing. He deprecated attention being solely directed to carbon printing for permanency. He believed that a process was yet to be worked out in which beauty and permanency were fully combined. Without saying that he alluded, in expressing this hope, to collodion-chloride printing, he might remark that the results of that process rivalled any other in beauty, and he believed that, properly worked, they were quite permanent. A small carbon print which the Chairman had been good enough to hand to him was very delicate and fine, but he objected strongly to the vulgar glaze used to give depth and transparency.

The CHAIRMAN said the carbon process had come before them from time to time, but each time with some definite improvement.

He must confess that he sympathized heartily with every effort to secure permanency. At the same time, the Society gladly extended encouragement to all improvements, and he should be glad to see such a process as Mr. Hooper had indicated. It was by competition perfection was attained, the history of the English microscope affording an admirable illustration of perfect results attained by the successive efforts of good men who were determined not to be beaten by each other.

Mr. BLANCHARD called Mr. Sawyer's attention to the advantages of paper negatives, as superseding the necessity of double transfer.

A vote of thanks to Mr. Sawyer was carried by acclamation, and acknowledged in a few words.

It was announced that Mr. Spiller would read a paper on "Recent Advances in Photography" at the Society of Arts on Friday night, and that at the next meeting of the Photographic Society Col. Wortley would read a paper on "Comparative Rapidities." The proceedings then terminated.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held in the rooms of the Society of Arts, John Street, Adelphi, on the evening of Thursday, April 8th, Mr. SEBASTIAN DAVIS in the chair. The minutes of a former meeting having been read and confirmed, Mr. J. Porter and Mr. J. B. Hall were elected members of the Society.

Mr. F. YORK then read a paper on his experience with the wet process during the past year, and exhibited some negatives taken with a bath giving sandy plates, with the same bath after treatment with sulphate of baryta, and with the same bath after treatment with nitrate of baryta. The first plate was very full of pinholes, the second little better, whilst the third was quite clean and free from any defect. He also showed some examples of non-actinic glass made by coating plain glass with aurine dissolved in varnish or dissolved in collodion. The latter gave the best result.

The CHAIRMAN, in proposing a vote of thanks to Mr. York, made some interesting observations on the excellent paper they had heard read. Referring to keeping the iron solution ready dissolved in a concentrated form, he mentioned his own experience, to the effect that such solutions kept well in the dark, but became per-oxidized if they were kept standing in the light. He also referred to a statement which had recently appeared in the journals, to the effect that an enormous reduction in the exposure might be effected if methylated alcohol were added to the iron developing solution. In his own practice he generally used pure spirit, but he had occasionally used methylated spirit, and had never noticed any difference in the action of the developer. Perhaps the matter might be worthy of further attention, but in any case it was a thing easily proved. Referring to collodion, he had always found it a good thing to have an old ripe sample, of which he could add a portion to a new sample before use.

Mr. WM. BROOK mentioned that he had found a decided advantage in the use of methylated spirit in the developer. He had referred to its advantages in one of the YEAR-BOOKS three or four years ago. Referring to the treatment of collodion, he had frequently added bromine with advantage. He put six or eight drops of pure bromine into an ounce of alcohol, and allowed it to stand in the sun for a few days until it became colourless, and then added a few drops to an ounce of collodion; it gave sensitiveness and brilliancy.

Mr. FOXLEY said, in answer to a question, that absolute methylated spirit was not now permitted to be sold. The strength was generally about 65 o.p.

A desultory conversation on the subject of methylated spirit followed. Some members used it constantly in the developer, but did not notice any special effect. Others found difficulty in obtaining this spirit except in the form of "finish," with a certain portion of a gum dissolved in it.

Mr. WHARTON SIMPSON suggested that he had found a simple method of meeting that difficulty. The law prescribed to certain dealers that they must not sell methylated spirit retail without the addition of a certain proportion of some gum, but it did not say what gum. He therefore asked to have gum-arabic added; and as this was insoluble in the spirit, he removed it without difficulty. Regarding the proposed addition to the developer to which the Chairman had alluded, if he remembered rightly, it was methylic spirit, or wood naphtha, which was said to give the advantages in exposure; not methylated spirit, which was a

different thing. Methylated spirit was ordinary ethylic alcohol, with ten per cent. of methylic alcohol added.

Mr. BARNES had found positive disadvantage in the addition of methylated spirit to the developer.

A conversation on the addition of nitric acid to the bath, and Mr. Black's extremely acid bath, followed, and on the bleaching of some samples of collodion when tincture of iodine was added.

Mr. YORK thought the idea that the use of methylated spirit caused the rapid loss of colour after adding iodine was an error. He attributed it to the use of old ether which had become ozonized, and this ozone produced the bleaching action.

A conversation on the cause of pinholes followed.

Mr. FOXLEY thought that the pinholes were not due simply to excess of iodide of silver, as pinholes were unknown in the old days of simply iodized collodion. He thought the minute crystals formed were probably an iodo-bromide of silver.

Mr. YORK thought that they were not iodide of silver, as the precipitate by the barium addition did not darken in the light.

Mr. WARNERKE said he had reason to believe they were fulminate of silver formed by the action of alcohol on nitrate of silver, as he had carefully tested, and found that a collection of the crystals possessed the fulminating or explosive quality.

Mr. SIMPSON said that the question of pinholes, and their various causes, was certainly a perplexing one, and by no means as yet thoroughly solved. It was not impossible that a compound salt containing both iodine and bromine was sometimes formed; but that excess of iodide alone would produce pinholes he had most indisputable evidence. Something like twenty-two years ago, when the saturation of the negative bath with iodide was proposed, he tried the experiment, and very literally saturated the bath with iodide of silver. To his horror, the first plate which came out of the bath afterwards was literally riddled with pinholes, although it had been working quite clean before.

A Member said that he always found that pinholes indicated an over-worked bath, in which he believed iodide had accumulated. The usual process of diluting, sunning, and strengthening again always succeeded in his hands.

After some further conversation, the subject dropped.

Mr. KENNETT then proceeded to give an interesting demonstration of the working of the gelatine emulsion process, from the preparing of the emulsion by means of his sensitive pellicle, to the production of a transparency by exposure to the light of a gas flame. The demonstration was very interesting, and especially illustrated the sensitiveness of the bromo-gelatin by the extreme darkness necessary in coating, developing, &c., the smallest trace of light through deep ruby glass being the only permissible illumination in the dark room.

After a vote of thanks the proceedings terminated.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE ordinary meeting was held at the Memorial Hall on Thursday evening, the 8th inst., Mr. W. T. MABLEY, President, in the chair.

The minutes were read and passed, and Mr. R. P. Gregson, of Blackburn, elected a member of the Society.

Mr. FRANKLAND presented the Society with an oxy-hydrogen lantern, made by Messrs. Pumphrey Bros., of Birmingham.

The PRESIDENT said the members could see before them the handsome present of Mr. Frankland, and would no doubt acknowledge it in a suitable manner.

Mr. Frankland received a hearty cheer for his liberality.

As there was no special business before the meeting, the proceedings terminated at an early hour.

C. ADEN, Hon. Secretary.

EDINBURGH PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of the Society was held in 5, St. Andrew's Square, on the evening of Wednesday, the 7th inst., Dr. THOMSON, the President, in the chair.

The minutes of previous meeting were read and approved, and the following gentlemen admitted ordinary members:—R. Gravatt, Robert M. Alster, William Barlas, William Nicol, Thomas Lymington, W. D. Young, Henry Welsh, and Andrew Slater.

Mr. BLACK, of 2, George Square, then laid on the table, for the inspection of the members, several folios of photographs which his brother had recently brought to Edinburgh. They were principally copies of the works of the ancient masters, including Titian, Paul Veronese, Guido, Michael Angelo, &c., &c., from the best

* A rough method of producing hydrobromic acid.—Ed.

museums, galleries, and churches in Italy, and were intended to give to those who cannot themselves see those interesting collections an opportunity of seeing and studying those fine works. The collection was very much admired, and much surprise was expressed at the admirable way in which the difficulties of such reproductions had been overcome.

The following question from the "box" was then read:—"Can the relative merits of lenses by different makers be discussed at the Society's meetings?"

Mr. W. NEILSON said that he thought the only answer possible was No. As a society, it would not be right to pass any verdict on any question between rival makers. Such a discussion ought not to be held, unless at the request of those concerned. If a manufacturer were to send an article to the Society with the request that it might be tested and reported on by a committee, he could understand that coming within the province of the Society; but to the question as put he proposed that "No" be given for an answer—a motion which was carried *nem. con.*

Mr. W. DALLAS then exhibited and described a new drying box (see page 184) for dry plates, especially gelatine films, where it is desirable to be able to secure a well-regulated supply of warm, dry air. The arrangement was much commended, and as Mr. Dallas coated and dried a gelatine plate in presence of the members, there could be no doubt that it will be found to be all that its inventor claims for it.

Mr. W. H. DAVIES then read some "Notes on the use of permanganate of potash as a toning and intensifying agent," and exhibited a number of specimens by way of illustrations of his opinions (see page 185).

Dr. HUNTER thought that there was sometimes a difficulty in attributing fading to its true cause, as he had often found it to come on when no extraordinary chemical had been used, and in cases where returned hypo was out of the question. He believed, however, that in many cases it was caused by impurities in the washing water. He had found that prints washed with the pure water from the hills in India stood much better than those that had been washed in the sometimes impure water of the plains, and he thought it just possible that that fact might apply to the transparency that had been toned with the permanganate salt.

Mr. TURNBULL had frequently used the permanganate in toning and intensifying, but had not paid much attention to its keeping qualities. He thought, however, that as there was a doubt in the matter, and as there were plenty of equally useful chemicals, it might with advantage be laid aside.

Mr. A. S. MACKAY wished to call attention to some of the enlargements exhibited by Mr. Dallas, especially to two from the same negative, the one touched, the other untouched. The untouched head possessed a character and breadth which had been altogether destroyed by the touching to which the other had been subjected. The touching of such heads should only be attempted by a really skilled draughtsman. He did not, of course, mean to say that retouching in some degree should never be attempted, but simply to ask the members to look at the pictures on the table, and satisfy themselves as to the amount of character that had been sacrificed, and, if they did retouch, see that it was skillfully done.

Dr. HUNTER then read a paper on "The Aid which the Fine Arts have derived from Photography" (see page 184), and illustrated it by a large collection of prints, &c. The paper was listened to with much attention, and elicited frequent expressions of approbation.

The CHAIRMAN said the meeting had been peculiarly fortunate in having so much interesting matter before it. Dr. Hunter had furnished much material for interesting discussion, but the late hour to which the business had extended would, unfortunately, prevent it taking place. He then laid on the table some prints for the Society's album, sent by Marshall Wane, through Mr. Bashford, of statutory by a native of the Isle of Man, Mr. Swennerton, at one time a student in Edinburgh, and at present resident in Rome; the group was his last production, and showed evidence of great ability. He (the President) proposed that the thanks of the meeting be given to Messrs. Black, Dallas, Davies, Dr. Hunter, and Mr. Wane, which was unanimously agreed to.

The CHAIRMAN then read a communication from Mr. Baden Pritchard, in reference to a proposal to raise a fund for the benefit of Mr. Rejlander. He wished he had sufficient eloquence to plead the cause of the widow as it deserved. The Society had recently sent her a letter of sympathy; it now had an opportunity of putting the sympathy into practical effect. What was especially wanted was the handing over to Mrs. Rejlander the whole of the negatives left by her lamented husband, and thereby putting her into a position of honourable independence, and he had no doubt

the Society, or rather the members, would consider it a privilege to do each their part in the good work.

Mr. E. H. DAVIS suggested that the subject be placed in the billet calling next meeting, and that Mr. Pringle be requested to act as secretary, to receive subscriptions, and the meeting adjourned.

The first out-door meeting of the season was held on Thursday the 9th inst. The members assembled at the West End station at ten o'clock, and went by Caledonian railway to Colinton, where the cameras were unpacked and set up, and the work of the day began. Curiously enough, all the plates on the ground were the favourite beer and albumen.

The first exposures were got at the old Snuff Mill, almost the last of its kind in Scotland; and as it and its vicinity afford excellent food for the camera, nine plates were exposed.

The party then, on the invitation of Mr. Fleming, visited the interior of the mill; but as the process of grinding the tobacco was in full operation, they soon sought the open air, with the exception of some half a dozen, who, in spite the inconvenience, remained long enough to have the whole process of fermentation, grinding, mixing, and sifting, explained to them.

From the mill they proceeded up the waterside, by Juniper Green, to Currie, where the work of the day was brought to a close on some of the quaint old cottages that lie on the river's bank. An adjournment was then made to the Raccarton Arms, in which a pleasant hour was spent; and then the party took the train for Edinburgh, all highly pleased with the excursion, and hoping that it would prove a type of many such pleasant excursions that they would have during the approaching season.

Talk in the Studio.

M. DAVANNE'S FORMULA.—M. Davanne gives the following formulae, which we feel sure will have a practical interest for many readers, coming, as they do, from so distinguished a photographic chemist and so good a practical man:—For the positive printing bath—

Distilled water	...	...	...	100 c.c.
Silver nitrate	...	...	...	10 grammes

Add a few drops of a solution of carbonate of soda.

We may remark that this addition is made, first, in order to correct the acidity of the bath, due to the free nitric acid which common silver nitrate contains; and, secondly, in order, by the presence of a little insoluble carbonate of silver, to prevent the discolouration of the albumen. For the toning bath:—

Water	...	...	...	1,000 c.c.
Double chlo. of gold and potas....	...	...	...	1 gramme
Spanish white	...	...	...	5 grammes

For iodizing wax paper:—

Skimmed milk, clarified	...	...	...	500 c.c.
Potassium iodide	...	...	...	7 grammes
" bromide	...	...	...	2 "
Sugar of milk	...	...	...	10 "

This formula will, no doubt, be found good by those who prepare plain paper for enlargements done by development with gallic acid.

TOUGHENED GLASS.—Upon this subject, respecting which we gave an extract in our last, a correspondent writes to the *Times* as follows:—"With reference to the theory of 'toughened glass,' I venture to suggest that it is the same as that of Prince Rupert's drops, viz., that by the sudden cooling of the glass its exterior is contracted to such a degree as to compress the central portion into a smaller space than it would have occupied if the whole had been cooled gradually. Hence the centre is in a state of extreme tension, which bursts the drop into minute fragments when the equilibrium between the inside and outside is destroyed by breaking off the thin end of the 'bulb' or by engraving the 'toughened glass' with a diamond. The glass, therefore, cannot be said to be 'toughened,' but 'case-hardened,' and hence it comes under the same category as 'case-hardened' iron, tempered steel, &c. This theory is directly opposed to that of Dumas, who considered that the rapidly cooled exterior, by preventing the contraction of the heated interior, keeps it in a state of tension, instantly relieved by breaking the smaller end of the drop. But in this case there would be no explosive tendency, but, on the contrary, a

collapse; whereas the Rupert drops scatter their fragments so widely as to render them dangerous playthings. Whichever be the true theory of the discovery, its applications are so numerous and important, that we may expect that glass will shortly supersede the use of metals for household and manufacturing purposes. In conclusion, I would suggest that since semi-transparent porcelain differs very little from glass in its composition, it may, perhaps, be possible, by carefully heating valuable specimens of China, and subjecting them to this process, to harden them to such a degree that *Mater-familias* may see with equanimity her best Sévres or Worcester China service scattered over the floor by her maids or children."

PALMISTRY.—"Mr. Woodbury recommends," says the *London Medical Record*, "that for purposes of identification (of criminals, for example) it is only necessary to get a distinct photograph of the palm of one hand, taken in a strong oblique light, so as to bring out the markings strongly. This will be found in a map, he says, never alike in two persons; no disguise short of actual disfigurement can do away with the difference." Upon this the *Standard* makes the following comments:—"Mr. W. B. Woodbury's recommendation as to the best means to be taken for the purpose of identifying criminals is one of those suggestions which are theoretically perfect, and practically replete with difficulties. It is doubtless true that no two hands are precisely alike, and that a student of palmistry would be able to detect differences; but at the same time it is probable that a great many of the hands which are habitually devoted to the practices of picking and stealing differ from each other so slightly that none but a scientific person could swear infallibly to a hand from a photograph. At any rate, to an ordinary observer there is much more dissimilarity between faces than between hands, and while we can obtain likenesses of the former, it seems idle to seek for the latter. Mr. Woodbury's suggestion is ingenious, but, we fear, not feasible."

PUSHING BUSINESS.—In the course of some remarks on this subject in our Philadelphia contemporary, Mr. F. B. Clench says:—"I am satisfied that the public do not know what they want in the way of pictures, and it is for the photographer to decide and show. The public will buy any amount of pictures more than they do if they can be brought to their notice in a proper manner. In 1863 I bought my first 4-4 camera, and it sat in the corner of the operating-room for a month without being used, business, of course, being dull. One day I commenced figuring the dividends it was returning me sitting there, and the result was not satisfactory to me. I got it out and cleaned off the dust, and turned over a new leaf. The next subject was a young lady for a card. I also made a 4-4, and when she came in for her cards, I had it framed up on the wall for a specimen; I also had an extra one made for her to buy, but she did not buy, so I gave her the picture. She then purchased a frame, on which I made enough to pay for stock. Time was not worth anything; besides, I had practice, and that is knowledge, and knowledge is capital. So I tried to figure I was ahead on the transaction. I filed the negative away, and in about six months the lady called to see if I could make six duplicates, also brought her sister to sit to match it, thus making a good paying job. Thus, by keeping my spare time employed in this way, I soon had plenty for my 4-4 lens to do. I think if those who complain of dull business would get out the big camera, or any other camera they have advertised for sale for want of use, and put it to work, they would soon have plenty for it to do. Try for a month by putting up a card in your work room headed speculation work, and on it put amount of moneys received for speculation work. Make negatives of all likely subjects you can get hold of; ask them on the street, or wherever you find them, to come in and give you a sitting—you want to get out some new styles. Show unfinished proofs, but have them look as well as possible, for it is hard to make folks see what you are going to do by retouching; they generally judge by what they see in the proof."

FROSTED GLASS, useful for screens, &c., is made by laying the sheets horizontally, and covering them with a strong solution of sulphate of zinc. The salt crystallizes on drying.

CLEANING SILVER.—A strong solution of hyposulphite of soda is excellent for cleaning silver. Cyanide of potassium answers a similar purpose, but, being a dangerous poison, its use is better avoided.

To Correspondents.

Some delay may occur at the present moment in answering correspondents, owing to the absence of the Editor from London.

P. Z.—The reason for the delay in making the drawing in the Art Union connected with the Photographers' Benevolent Association was explained some time ago. You will, however, find an announcement respecting the matter in our advertising columns this week.

CYRIL VANDYKE.—There is no book published on the powder carbon process. An article describing the details appeared in the *PHOTOGRAPHIC NEWS* for 1870, page 243, vol. xiv. It is precisely the same in principle as the powder process of reproducing negatives described repeatedly in our volume for last year, and in our last YEAR-BOOK.

ONE IN THE TRADE.—There is no specific law by which the matter can be decided. You can only ascertain by trial. Begin with the thickness of a piece of common cardboard, and gradually increase by that thickness until you hit the precise distance. Use cardboard rings in making the experiment.

GUNNER.—Several of those you name are very excellent, but they are not intended for small plates, and, being, altogether for field use, extreme portability rather than space for working is chiefly considered. That you indicate by D is the most convenient, especially as it must serve the purpose of a dark-room at home, as well as a tent for field work.

A. J. SIMPSON.—P. O. order duly received and passed to your credit. We have no recollection of the circumstances you name, and as you give no date we have no clue for reference. It is quite certain, if we received any specimens, we should acknowledge them, and if no acknowledgment appeared, that fact may be taken as evidence that the specimens never reached us. We do not know of any method whereby you can obtain specimens of various kinds unless you have some agent in London who will select and purchase them for you. Failing that, if you send a remittance to some photographic publishing house, such as Marion and Co. or the Stereoscopic Company, and ask for a selection of a given kind, you will probably meet with that you wish. We cannot tell you the price, because we do not know what size you require. Card size, the price will be one shilling each. The *PHOTOGRAPHIC NEWS* during 1874 had several articles on cameo medallions and cameo vignettes. Our YEAR-BOOK for 1874 has an article on the subject, page 117. There is no better bath for toning a rich purple than the acetate bath, but it is necessary to have a fine, brilliant negative in order to secure the richest tones in the print.

A. B. C.—You cannot do better than apply to Mr. Blanchard, Albany Court Yard, Piccadilly. We regret that we have not time to write privately; but we could not give you better advice in the longest letter.

O. A. G.—If you are not familiar with the operations you will find it best and most economical to send to a refiner.

BELLOWS.—We regret that we cannot give you any technical information as to the manufacture of bellows for cameras.

A. J. F.—Thanks; a copy had been found.

Several notices and articles are compelled to stand over for want of space.

Several Correspondents in our next.

REJLANDER MEMORIAL FUND.

Subscriptions received:—

R. Faulkner	...	...	...	...	£2	2	0
Dr. Diamond	...	...	...	...	2	2	0

PHOTOGRAPHS REGISTERED.

Mr. G. W. LARSEN, Sterling,
Eight Photographs of Views and Buildings in India.

Mr. H. HEAT, Hull,
Photograph of Dr. Kenealy.

Mr. J. T. ALLESTON, Bridlington Quay,
Two Photographs of Anderson and Burckshaw's Life Boat.

Mr. W. BACON, Manchester,
Photograph of Old House in Manchester.

The Photographic News, April 23, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. THE CANDIDATES FOR ADMISSION TO THE ROYAL SOCIETY— THE REJLANDER MEMORIAL FUND.

The Candidates for Admission to the Royal Society.—There were upwards of fifty candidates for admission into the Royal Society this year, and as the number elected is limited to fifteen annually, the proportion was about four aspirants to every fellowship. For many years past there has been as large a number of candidates as this for the "blue ribbon" of science, for obviously the more limited and select a body becomes, the more anxious are outsiders for admission into it. It is for this reason that one sees scientific men year after year striving for the honour of a chair in the English Academy, although, strange as it may appear, it always seems that the longer a candidate waits the less chance he has of election. If a man is not elected after the third year of his being before the Council of the Royal Society, the odds are against his ever being able to see the letters F.R.S. after his name at all, although, on the other hand, again, he must have secured a very large share of public attention if he succeeds in obtaining the object of his desires at once. Either he must have made some scientific discovery, the importance of which is still fresh before the world; or he must enjoy a position, or post, such as at once stamps him as a man of superior ability. There were this year several candidates for Royal Society honours known in photographic circles, and we had hoped sincerely that some of them would be among the chosen few. Captain Abney, Dr. Dupree, Mr. J. W. L. Glaisher, Mr. Spiller, Colonel Stuart Wortley, and, we believe, Lord Lindsay, were put forward by the Fellows of the Royal Society as eligible men for election into that body. It is a polite fiction, by the way, that no one can nominate himself as a candidate, but must leave the matter entirely in the hands of friends who are already Fellows, and who are supposed to nominate you without your leave, and canvas unasked and unknown to you. This is the theory; but we fancy a candidate is rarely proposed without knowing a good deal more about the matter than one might give him credit for. Captain Abney, it will be remembered, was of considerable assistance to the Astronomer-Royal when organising the Transit of Venus observing parties; and we see that Sir Richard Airy, Dr. de la Rue, Mr. James Glaisher, and other well-known astronomers signed his certificate. Fortunately for Captain Abney, he is known not only as a photographic astronomer, but as a chemist, and he received support, therefore, from two parties at once. Unfortunately, there was another Engineer officer for election—General Scott—and this gentleman has been selected, so that Captain Abney cannot now secure the honour until next year. Dr. Dupré's claims as a chemist were also strong; he is known as a practical teacher of the sciences, and also as a sound investigator, some researches he made with gun-cotton having, no doubt, made his name familiar to many photographers. His candidature was so strongly supported by chemists that he could not but be successful. Mr. J. W. L. Glaisher, the son of the worthy President of the Photographic Society, and, with Captain Abney, a member of Council of the Astronomical Society, is well known both as an astronomer and mathematician, having been second of his year at Cambridge; and although still a young man, his qualifications for the Royal Society have gained him admission to that body at an unusually early age. Mr. Spiller's name is known to all photo-chemists for his researches connected with the latent image, the preservation of dry plates, and other matters, and his name, like that of Colonel Stuart Wortley, is too well known among photographers to require any comment on our part. The strong alkaline developer of Colonel Stuart Wortley was one of several claims put forward on behalf of that gentleman for admission to the Royal Society. Mr. Roberts, the Chemist to the Mint, is among the selected for admission to the Society, being the only other chemist besides Dr. Dupré.

The Rejlander Memorial Fund.—The Rejlander Fund, which has been started for the purpose of satisfying a few claims that arose during the protracted illness of the late Mr. O. G. Rejlander, and securing to his widow the valuable art negatives that are in existence, is making fair progress, we are glad to hear; and there is every prospect of the efforts of the committee being successful if photographers generally will only take up the matter and contribute donations, however small, to the object in view. The works of Mr. Rejlander are so well known among photographers, and their tendency to improve our art so thoroughly recognised throughout the country, that there are few among us who have not benefited in some way from their teachings; and for this reason, if for no other, we all feel the sad void which his loss has caused among us. We earnestly hope that a handsome sum of money may be raised for the Rejlander Memorial Fund.

ON A METHOD OF ENLARGING.

BY VALENTINE BLANCHARD.*

In the "good old times" most of the good old plays commenced with a prologue. My play may be bad; therefore my prologue shall be as long as possible. In the race for supremacy most really good things come in first, by the very force of their goodness, but not always. The reason why the Daguerreotype has become a thing of the past is contained in the fact that, whilst it has been "a thing of beauty" and, I firmly believe, under proper conditions, might become a "joy for ever," it has not had within itself the power of multiplication. On the other hand, however, that which we know as the Calotype or Talbotype process (and after it, following in the same groove the collodion process) has grown into a gigantic success—partly because of qualities, unknown in the Daguerreotype process, which have taken hold of the popular mind, but also largely because the powers of multiplication are very great. But, after all, these are limited; and, for extensive publication, new methods, such as the "Woodburytype" and "Albertype," have come to the front for book-illustration.

The method of what we call negative-printing took the lead of other processes because of its powers of multiplication; but if, instead of this, we had had in the early days of photography a method of producing a perfect transparent positive as the first product of our labour, and from this we had had the power of multiplying *ad libitum* our negatives, how much the sphere of usefulness would have been enlarged, and how different would have been the position of photography to-day! By the method I am about to describe, the powers of multiplication are most extensive; for the negatives can be reproduced without limit.

My justification, then, for appearing before you to-night is contained in my prologue.

The examples of my method are before you in your hands. From a photographic point they are not superior to two or three other methods of enlargement extensively practised; but for artists they have a quality of texture unknown in other methods. My own feeling on this point is confirmed by several artists of great distinction—amongst others, several Royal Academicians. On this question, however, the tribunal assembled is competent to award a verdict; and I await the decision.

The method I have the honour to describe to you is partly based upon a process of enlargement described by me about ten years ago, and which has since been largely sold throughout the country as a secret process. In the paper I refer to, I dwelt upon the fact that if a transparency were made larger than the negative required, some of the defects were reduced instead of being increased. This is so clear that I need not now dwell upon this point.

I have always had a great affection for paper negatives. I have not yet forgotten my first great delight, nearly thirty

* Read before the Photographic Society of Great Britain.

years ago, when I was permitted to see a paper negative developed; and I can now say, after all these years of experience, that the pleasure now felt in producing a good collodion negative is nothing in comparison to it. I am sure all here who have practised the Calotype process will reiterate my words.

Well, now, without more circumlocution, I will briefly describe my process.

I produce at one operation a transparency of the size required. The best method I find for this is to use a reflector of looking-glass fixed outside one of the windows of the studio at an angle of 45° , and using north light only, never sunlight. This reflected light falls on a sheet of fine ground glass, which has replaced one of the ordinary squares of the window. All the light not needed is shut out by a piece of millboard. A hole of the requisite size is cut in this, and the negative is fastened by drawing-pins to the millboard. The millboard fills exactly the pane of ground glass, the square side of which is, of course, turned outwards.

A long bellows-camera is now brought into position, and a glass transparency is made from the negative. The exposure is very important, and the time can only be learned by practice. The image is developed with a weak solution of iron about ten grains to the ounce; and when the detail is fairly out, a much stronger solution may be employed to give force. I would here say, *en passant*, that all photographers are much indebted to Col. Stuart Wortley for his demonstration of the importance of strong solutions for giving force after all the details are brought out by weak ones. It is important for my method that the transparency shall have every detail possible, and at the same time as much power as can be obtained. Indeed all the force of a good negative must be there, but in reverse. The transparency must be fixed and varnished in the usual way. When the varnish is hard, all the transparent spots can be mended; and if the shadows are weak in places, artistic touches of Indian ink or other colour can be employed either on the front or wrong side at will.

Prints on paper are now to be made from the transparency; and they do not need toning, for the colour given by the hypo is better for the after process. When the print is well washed, it is dried; and now any defects of the opposite kind can be touched out.

The next process is to wax the paper negative, to make it more transparent. This is best done by aid of a flat iron. The print should be made very hot by the frequent passing of the iron, and whilst still hot rubbed with a cake of white wax; alternate ironing and waxing will soon get a tolerable film of wax all over the negative; but a little skill will be necessary to do this part of the process nicely. The print should now be put between thick blotting-paper, to remove the superfluous wax, and the paper negative is now ready for use as an ordinary printing negative. It should be much over-printed, for the waxing process reduces the strength immensely. The right depth, of course, can only be found out by practice. It will be seen that by this method the original is not used except for the transparency, and that the negatives can be made *ad libitum* from the transparency by an ordinary printer. If, therefore, a large number of copies were needed in a hurry, it is only necessary to multiply sufficiently the number of negatives from the transparency to supply the demand.

PHOTOGRAPHY IN PERMANENT PIGMENTS, WITH RECENT IMPROVEMENTS IN AUTOTYPE TRANSFER.

BY J. R. SAWYER.*

THERE is no branch of photography more interesting in itself, and more worthy of consideration, than that which relates to the production of photographic prints in a permanent and unalterable form; and here, at the very outset, it is worth while pausing to inquire what effect a statement

like the preceding (which implies that photographs are produced in a form *otherwise* than permanent) must have upon those outside the profession, who are not supposed to know or to inquire too curiously into the *modus operandi* of a process giving them pictures which seem, for a time at least, to be perfectly unexceptionable.

Surely it must be a matter of grave reproach to the votaries of this handmaid of science and art if it be true that faithful transcripts produced by the unerring pencil of light, the actual "holding of the mirror up to nature," however beautiful in colour, exquisite in delicacy, and wonderful in definition, will, like the "baseless fabric of a vision, fade, and leave not a wreck behind." Fortunately this is true only in part; I hope to be able to demonstrate this evening that there is a method, the slow growth of years, the result of careful experiment and conscientious work of many minds, by which permanent photographs may be produced with almost, if not quite, as much facility as the universal production known as silver prints.

Can anything be more disheartening than to look through a costly album or scrapbook containing silver prints which have been in existence, say, only half a dozen years (portraits of friends, perhaps passed away for ever), but are yellow, faded?—the mere ghosts of what were once satisfactory mementos, views of places and objects which served to call up pleasant memories. The proverb says, "Whatever is worth doing at all, is worth doing well." Do we do photography well? Do we do it justice? This defect of want of permanency has stimulated the efforts of men of note in England, France, and Germany to find out a remedy, and the honours are pretty equally divided between the three countries; the result has been the invention, and making practicable, of at least three different methods, all of which produce photographs in *unchangeable* materials. They have a common foundation—namely, the peculiar action which light has upon bichromates exposed to its influence in contact with organic matter. These three methods are designated respectively the Autotype, the Woodbury or Relief Process, and the Collographic Printing Process. It is with the first of these that I propose to occupy your attention during some portion of this evening. An Autotype is a production (by the action of light through a negative, or other partially transparent medium) of an image or picture in permanent pigment.

To Mungo Ponton must be attributed the discovery that paper, or similar material, immersed or treated with a solution of bichromate of potash or ammonia became changed when exposed to light. Becquerel found that paper treated with size, gum, or gelatine was acted upon more rapidly than paper not so treated. This fact suggested to Poitevin that it might be possible, by mixing a pigment with the gum or gelatine, to produce a picture by the retention of those parts acted upon by light, and the washing away of the portions upon which the light had not acted; but here was the first stumbling-block. Poitevin spread his layer of gelatine containing a pigment upon paper, sensitised it with a solution of bichromate of potash, exposed it to light under a negative, then tried to wash away in hot water those parts upon which the light had not acted; to his surprise he found this impossible: on substituting albumen for gelatine, and applying a coating of extreme thinness, he succeeded in obtaining copies of engravings and drawings when the picture was produced by absolute lines or stipple.

The late Mr. Blair, in England, and the Abbé de Laborde, in France, almost simultaneously hit upon the cause of Poitevin's failure; they showed that the action of the light induced a very thin insoluble film over the whole surface of the picture which had been in contact with the negative; therefore, in order to be able to attack the gradations of solubility corresponding to the gradations of intensity in the negative, the operations must be directed to the back of the picture. To effect this they spread their gelatine on very thin paper, as transparent as possible, and imposing this material upon a negative, with the thin paper in

* Read before the Photographic Society of Great Britain.

contact with its surface, printed the image *through* the thin paper.

It is easily comprehensible that by such a procedure the back of the picture could be at once got at for the purpose of development; and the action of warm water proved quite sufficient to remove those portions of the gelatine to which the action of the light had not penetrated, and which were consequently soluble.

From this it will be seen that an Autotype picture is really a relief, the elevations and depressions thereof being due to the greater or lesser amount of penetration of the light into the film, this being in accordance with the gradation of light and shade in the negative: the light parts of the picture are those where the light has had a feeble action; and the greater portion of the gelatine and pigment being washed away in development, the film is so thin in these places as to allow the paper or material upon which the picture is placed to show through, the half-tones and deep shadows being correspondingly made by the varying thickness of the pigment.

Passing over the many ingenious methods suggested for doing away with the necessity of printing through the thin paper by which the gelatine-pigment had been supported, we arrive at the invention and working out of a really practicable method of printing in permanent pigments by Mr. Swan, of Newcastle-on-Tyne. This gentleman made a tissue of gelatine and pigment by coating a sheet of glass with collodion; upon this he spread his compound, which, when dry, he stripped from the glass. He placed the collodionized side of this tissue in contact with the negative in the pressure-frame. Before development he cemented the surface which had been in contact with the negative to the surface of the paper or support upon which it was desired it should remain, with some material insoluble in hot water. The development was therefore carried on from the back; and the various grades of the picture appeared by the washing away of more or less of the gelatine in accordance with the gradations of light and shade in the negative. The idea soon struck him that the troublesome method of making the tissue as described could be dispensed with, and that the pigmented compound could be made upon ordinary paper if it were possible to remove this paper before development. It must be borne in mind that an Autotype picture cannot be developed from that side which has been in contact with the negative, because it is covered with an insoluble film, and that the action of the light penetrates to a greater or less depth into the gelatine compound according to the intensity of its action. It would follow from this that if the compound was in sufficient thickness on the paper, the light would not *anywhere* penetrate its *entire* depth; and as there would be a film of total insolubility on one surface, there would be a layer of complete solubility on the other.

Mr. Swan coated paper with the pigmented gelatine of considerable thickness; this, when dry, was exposed under a negative to the action of the light; then, before development, it was coated with a solution of india-rubber, and laid upon a piece of paper similarly treated. The two were then pressed into contact by means of a rolling-press. On placing these conjoined sheets in warm water, the soluble layer of gelatine in contact with the paper upon which it had been spread (that is, at the back of the picture) became softened and dissolved by the action of the water, allowing the paper to be stripped off, thus leaving exposed the back of the picture, which the action of the water speedily developed, by removing that portion of the gelatine which still remained unacted upon by light, and therefore retained its original solubility.

But here another difficulty presented itself. A little consideration will show that a picture so produced (if from a negative taken in the usual manner) will be reversed. To remedy this Mr. Swan carried on the operation one step further; he coated paper with gelatine treated with alum, so as when dry to form a nearly insoluble compound. Upon this paper, in a moistened condition, he laid down

the developed picture, to which it adhered firmly, the picture being now imprisoned between two pieces of paper. When dry, the india-rubber coated paper covering the face of the picture was moistened with benzine, which, dissolving the rubber, allowed the paper to be peeled off, disclosing a photograph in permanent and unalterable pigment.

Without doubt Mr. Swan succeeded in working out an absolutely perfect method of producing photographs in permanent pigments; but at the same time it cannot be denied that the method was not an easy one. It involved the use of costly apparatus, and it was scarcely calculated to meet the wants of those members of the photographic profession who contemplate the printing of permanent photographs from their own negatives.

(To be continued.)

ON THE AID WHICH PHOTOGRAPHY HAS RENDERED TO THE FINE ARTS.

BY ALEXANDER HUNTER, M.D.*

We must now proceed to particularize, and to describe by photographs which I shall now hand round, some of the best uses and applications of the art, for that it is now a branch of the fine arts, and one of its most valuable coadjutors, every artist must admit. At the same time, I hope to be able to satisfy our photographic friends that the fine arts have some advantages, amongst which must be classed a larger, grander, and nobler field for the display of their talents; a wider field, both of vision and of application; and a delicate refinement, both of sentiment and of observation, which allows the artist to abstract from nature beauties of outline of form, of light and shade, and of colour, which, if not so early of attainment in photography, have hitherto not been so successfully mastered. On the other hand, while we claim for the fine arts the higher place in relation to deep thought, delicate refinement, and powerful expression, we must not overlook the fact that photography can also boast of being able to catch delicate feelings and passing emotions and efforts, and to give them a wonderful reality and permanence. Here, however, it is that the difference is apparent: passing actions, sentiments, or emotions must be well and truthfully represented, or they cannot be got in the camera. In fact, we must have the good actors, or we do not get the good pictures; and besides these, we must have the good manipulator, the skilled chemist, and the eye to detect tasteful arrangements, grouping, chiaroscuro, and appropriateness of detail to make up a picture. The artist, on the other hand, has the power to select beauties, reject deficiencies, omit redundancies, and to refine and combine all the varied agencies of his art. Some of these the photographer must take as they come, and to his sorrow he finds that all nature is not suited for his art; that very little of it is perfect, and that little is often very difficult to combine harmoniously.

But I can better explain my meaning now by coming to particulars and comparisons. One of the grandest applications of photography has been the reproduction of the frescoes of Michael Angelo, Raphael, Correggio, and the Italian masters. Some of these are fully more pleasing now than the frescoes themselves, as the latter have suffered most materially from damp, decay, and restorations; and these defects are not so apparent in the Autotype photographs by Adolphe Braun. Most of you are probably familiar with these grand fresco reproductions from the Vatican, the Rospigliosi and Parma Galleries, and Raphael's cartoons at Hampton Court. Next in importance I would be inclined to rank the photographs of the sculptures of antiquity, but in these there are occasional imperfections arising from prominent portions of figures being magnified, while receding parts are diminished; stains and blotches on the marble also occasionally detract from the beauty of these; but when the photograph is taken from a clean marble statue or a fine plaster cast, the result is generally very pleasing. Bas-reliefs and alto-relieves can be represented with great

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A VERY SIMPLE AND EFFICIENT ENLARGING PROCESS.

A VERY curious illustration of the fact to which we have more than once recently adverted, that much valuable matter lies entombed in the journals, comparatively unproductive, for the want of enterprise on the part of some skilled worker to carry the processes indicated from the point at which they had been left by the experimentalist to their highest practical issues; and an illustration further of the independent discovery or re-discovery of a method identical with one of those processes published long ago without fructifying, was recently furnished. The method of enlarging described by Mr. Blanchard at the Photographic Society on Tuesday evening is, we venture to say, one of the most simple and efficient in existence; and the examples with which he illustrated its capabilities were amongst the finest enlargements we have ever seen. We may go further, and affirm that we have rarely seen landscapes taken direct equal them in some of the highest and most valuable pictorial qualities. The process with Mr. Blanchard is, beyond a question, an original one, and yet it is a process we ourselves worked out and published years ago. It is about fifteen years since we first attempted the process, and a few years subsequently we worked it out and described it in the NEWS. When the question of enlarging was brought again prominently before the public three or four years ago, we were again reminded of the method in question, and we published it in the YEAR-BOOK for 1872. As the article is brief, and contains some suggestions of interest, we reproduce it on another page. Fortunately for the photographic public, Mr. Blanchard hit independently upon the same idea, and has worked it out to a degree of perfection for which we should scarcely have hoped, and to which, in our experimental efforts, we certainly never attained. We say fortunately, because it is so in a double sense: first, because his skill has so fully shown the capabilities of the process; and, second, because, with his characteristic liberality, he gives the results of his experience freely to his photographic brethren. On ascertaining that it had been already published, Mr. Blanchard at once abandoned the notion of bringing the method before photographers as a novelty, and it was only at our urgent solicitation that he consented to place before the Photographic Society a process and illustrations for which we feel certain every one present was grateful.

The process briefly stated is as follows:—An enlarged transparency of the full size of the required print is obtained from the negative by the ordinary wet process. This transparency must be as perfect as it is possible to produce it, for all the prints finally obtained should be facsimiles of the transparency. Slight retouching may, if necessary,

be effected on the transparency, but with a good negative this should not be necessary. From this enlarged transparency a print is obtained on albumenized paper by the ordinary method of printing in the pressure frame; and this print is the enlarged negative from which all subsequent prints are to be produced. It is important, therefore, that it be a good print in all respects, clean, sharp, and vigorous. It need not be toned, but simply fixed, and well washed. It is touched as may be required; then waxed to render it transparent, and is straightway ready for printing.

Many of the advantages of such a process are obvious; but there are some not quite so apparent until they have been considered. We shall, therefore, briefly summarize some of the most important advantages.

The process is simple and easy, involving no operations unfamiliar to photographers generally.

The negatives are not fragile, and are easily kept in stock.

The negatives are easily retouched with either pencil, stump, or water colour.

Where large numbers are required, nothing is more easy than to produce a number of negatives by printing from the transparency, and so print from a score of negatives instead of one or two.

The negatives can be printed at either side, either direct or reversed.

Paper negatives present the most admirable facilities for double printing, either in such simple form as the introduction of a background to a portrait or a sky to a landscape, or the more elaborate work of producing combination groups and similar compositions. If the ordinary methods of masking be employed, paper negatives facilitate the operation; but they present also additional facilities in the possibility of neatly cutting up and joining the various negatives, attaching the portions to a plate of glass, and producing one combined negative for printing at one operation, rather than printing portions of a series of masked negatives in successive operations, with all the care necessary for perfect junction at every printing.

Paper negatives, moreover, possess a beauty essentially their own, and yield prints with a specific texture which generally pleases the artistic eye. The texture need not be either coarse or granular; but it often gives a soft, delicate, atmospheric quality rarely otherwise attained. The examples showed by Mr. Blanchard on Tuesday night were chiefly landscapes produced from stereoscopic negatives, enlarged to sixteen inches by twelve. Without any lack of sharpness or crispness of definition, they all possessed that soft, delicate, painting-like quality which at once charms the artistic eye. In some cases, where the taste has been educated only on photographs, the observer may miss the hard wiry incisive line which charms the technical microscopic eye and disgusts the cultivated artist; but we imagine that few examined the specimens by which Mr. Blanchard's paper was illustrated without echoing the general sentiment that whilst they surpassed by far the greater majority of enlargements, they had rarely been equalled in pictorial qualities by prints taken from negatives direct in the camera.

A FEW MORE WORDS ABOUT DRIED ALBUMEN.

A FURTHER examination of the dried albumen to which we referred in our last impresses us more strongly with the numerous advantages it presents, not simply on the score of excellence, but also as a matter of economy and convenience, especially to amateurs—and, indeed, for photographers generally—for except in the preparation of albumenized paper the photographic consumption of albumen is rarely large. The chief use of albumen in the operating room is for employment in preliminary coatings, and in the preservatives employed in many dry plate processes. A

of work you cannot stop to choose your plate. *Every piece* should be fitted into the carrier, for nothing is so annoying as to find, when a plate has been coated and sensitized, that it is too large or too small to rest in the carrier.

The Method of Cleaning the Plates.—Having ascertained that each piece of glass is perfect and properly fits the carrier, roughened round the edges to guard against cutting the hands when handled, and then rinsed under the tap to remove from their surfaces the dust and straw of its packing, they are placed, *one by one*, into an earthen pot of undiluted commercial nitric acid, that the acid may gain free access to all parts of the glass. With new glass, an hour or two will be sufficient. They are then thoroughly washed under the tap, and albumenized.

Preparation of the Albumen.—Dissolve the white (perfectly free from germ) of one fresh egg—ordinarily about an ounce—in twenty ounces of water. A large stoppered bottle is the best thing, in which is placed half a handful of broken glass; this, when the bottle is shaken, serves to cut up the albumen, so that it mixes with the water. When shaken into a stiff froth, turn the bottle upside down over a filter of clean sponge or cotton, that the clear liquid may filter through into a clean bottle. This solution should be perfectly clear, but with the eggs not perfectly fresh it generally presents a milky appearance. In this case add a few drops of ammonia. This will in most cases clear it perfectly; if it does not, a second filtration will accomplish it. For pouring the albumen on the plate, a graduate will be found handiest. The plate has been cleaned in the acid and washed, and should not have been allowed to dry, as stains so often appear from unequal drying, which it is afterwards impossible to remove. For albumenizing, however, it is imperative that the plate be wet and clean. To insure against grit from the running water, tie up the tap at which you are washing with two or three thicknesses of clean linen to act as a filter.

Hold the plate horizontally, resting on the edge of the first finger, the thumb over the edge of one corner holding it firm. At the corner, diagonally opposite that held, the albumen is poured on, the graduate being brought as nearly as possible, without touching, to the surface of the glass, to prevent splashing. The plate is tilted that it runs toward the opposite corner, then to that held by finger and thumb, and finally allowed to drain off at the other corner. Do not touch the thumb with the solution, which you can see driving the water before it, and do not suffer it to run over the edges. The beginner will on his first trial recognize the fact that although this sounds easy enough, the performance is by no means a simple one, until experience has been gained. Indeed it is almost absolutely necessary in this operation, as well as coating the plate with collodion, and cleanly covering the exposed plate with developer, to see it done by an experienced operator, before success can be attained. The plate is, when albumenized, placed in a rack, the corner at which the albumen has been allowed to run off being placed lowest, that it may drain and dry spontaneously. The surplus albumen has been allowed to run into the sink, as from its inexpensive character it is not worth preserving. As the surfaces of the plate after albumenizing are exactly similar in appearance, and it is extremely difficult to tell which side has been coated, the plates should be placed in the rack on a uniform plan, that the coated surfaces face one way. Not to trust to the memory, stick a little piece of paper on the *uncoated* surface of the end glass, so that you may tell which way they are placed when you come to them again. When perfectly dry you can place them together without fear of injury. Stand them on end in your cupboard—albumen side inside—ready for use. *Guard against damp.* Stood up close together they are safer from dust than in a rack, and it is only dampness, a fatal enemy, you have to guard against. If, however, a doubt should at any time arise as to which side has been albumenized, you have only to breathe on the glass:

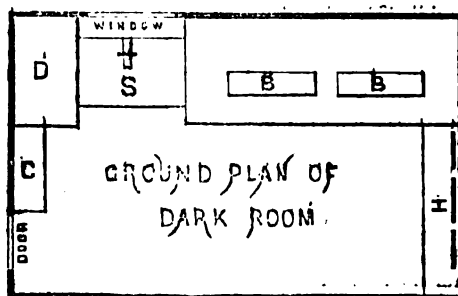
on the uncoated surface the breath lingers a moment or so, but scarcely an instant on that side coated.

For Old and Used Glass it is necessary to have a strong solution of concentrated potash. As with the acid, this solution must cover the plates perfectly. In about twelve hours the old varnished films will float off under a stream of water. The plates are then immersed in the acid solution, and, after a rather longer stay in it than in the case of new glass, they are treated in the manner already described for new glass.

There still appears to linger some prejudice against the albumenizing of glass plates—a groundless one, I venture to think. It is urged that the ammonia which it is necessary, in most cases, to use in the albumen solution injures the silver bath. I never found it so, and, if it is done carefully, cannot see how any of it can touch the silver solution, as the substratum of albumen is entirely covered by the collodion film. The method, however, saves so much unpleasant and really hard work, and is so uniformly certain in working, that it more than compensates for the little injury, if any, done to the silver bath.

The learner having seen how to coat his glass plates with albumen, and having acquired skill and facility in that most important operation, we may safely introduce him to the scene of his future trials (certain) and (let us hope) triumphs—

The Dark Room—that he may study its construction and understand the work of its various parts. First it will be observed that it is dark only in name.



The door closed, he is able to read in any part of it, but the light is coloured orange or yellow. It is necessary to exclude all white or actinic light. No cracks must be left open; doors must fit well, and every place of ingress of white light be carefully guarded. The dark room should also, if there is any chance for such a distinction, be the most orderly and cleanly room in the gallery, and with as few shelves as possible, for they harbour dust. The less room (consistent with ease and comfort of working) allotted to this department the better. It should have a convenient and ample supply of water well under control; a large tank or trough occupying the middle of one half of the side of the room; on each side a shelf—one for the bath, but well out of reach of splashings from the water, developing, and so on—and the other for the developer, developing glass, intensifying solution, and silver. In addition to these, all that is requisite in this room is collodion, pouring bottles, the negative glass, and the carriers.

C is the little shelf for collodion and glass plates, near the door, that in coating the plate the operator may have light. The plate coated, he turns round, and two steps bring him to BB, the baths, into one of which he slowly and steadily, without stoppage, lowers the collodionized plate. Properly coated, the plate is withdrawn and placed in the carriers or holders at H, then taken out to the camera. The exposure made, the operator returns the carrier to its place at H, takes out the plate, which he develops over the sink, S. Water is here laid on, the faucet, F, being conveniently to hand. The operator in a dark room of this construction has not to race all over the room at each process, but can quietly, and without disturbing any dust, follow each manipulation by walking only a step at a time.

The Photographic News.

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THE WET COLLODION PROCESS.— PINHOLES, ETC.

A NARRATIVE of the experiences of any successful worker in the most familiar and extensively practised of all photographic processes, the wet collodion process, is always certain, despite its familiarity, of an attentive and interested audience, and rarely fails to evoke an animated interchange of opinions and information in a photographic meeting. Mr. York's paper at the South London meeting, detailing his late experience with the wet collodion process, in which he declared that he had "no new thing to tell, only the old, old story, the management and formulæ of every-day life," which every photographer is interested in. The journals have for years past abounded with hints, suggestions, and information; and the great advantage of a paper like that of Mr. York's is, that it gives the successful results of those novelties which a skilful worker of extensive experience has tried.

Commencing with the cleaning of the plate, Mr. York has not been successful in using a substratum of albumen. Which formula he used was not stated; but we may suggest that if the dry albumen described in a former number, in very dilute solution—say one grain of the dried albumen to the ounce of water, and applied to the dry cleaned plate with a "Blanchard's brush"—it would be difficult to fail. The mode of cleaning the glass, adopted by Mr. York from some recent suggestion in one of the journals, is one of the excellence of which we can strongly commend. We first employed it nearly twenty years ago, and used it for many years with great satisfaction. We employed sometimes rouge, sometimes whiting, sometimes rottenstone, generally making it into a cream with methylated spirit and water. The plates were rubbed well with the mixture, which was then left on the glass to dry, being subsequently polished off with a soft linen cloth, or a soft, clean, dry wash-leather. The glass so treated was always perfectly and satisfactorily cleaned. There was one slight drawback to the method which may easily be guarded against. In the first place, if the final polishing away of the dried whiting, &c., were done in the operating room, the detached particles of dry powder floating about in the air were sometimes troublesome; and next, if the glass were roughed at the edges, particles were apt to adhere, and so contaminate the bath.

In dealing with the nitrate bath, the ever-recurring subject of pinholes arises. Mr. York attributes pinholes to something other than the supersaturation of the bath with iodide of silver, and believes the use of bromo-iodized collodion is in some way associated with the production of pinholes. Mr. Foxlee held a similar view, saying that in the earliest days of the collodion process, whilst simply

iodized collodion was solely used, and the bath was universally saturated with iodide of silver, pinholes were unknown; and he was disposed to believe that the deposit on the plate producing pinholes was an iodo-bromide of silver. This may on occasions be true, but the premises are scarcely exact. In the earliest days of the collodion process the practice of saturating the bath with iodide of silver was not thought of. It was, if we remember aright, suggested by Mr. T. R. Williams in the year 1853, and the method then, and for many years, in use was due to Mr. Thomas. Pinholes, although much less common, were not quite unknown. As we mentioned at the meeting, the first example of pinholes which we ever saw was in the early days of the collodion process. When the recommendation to saturate the nitrate bath with iodide was first made, we tried the experiment, securing thorough saturation. The result was a plate literally covered with the clear transparent spots only too well known now as pinholes; excess of iodide of silver being clearly the cause then, as it has been in thousands of cases since.

It is not unnatural, perhaps, to attribute all defects of apparently one character to one cause, and hence the common tendency to regard all pinholes in negatives as due to one cause. Having traced them in many cases to excess of iodide of silver, many are in the habit of regarding all pinholes as due to that cause; whilst, on the other hand, pinholes having been found where it was scarcely possible excess of iodide of silver could exist, there is danger of coming to the conclusion that excess of iodide of silver and pinholes had no legitimate connection. Pinholes undoubtedly arise at times from other causes than excess of iodide. In Mr. York's case it seems very improbable that the defect was due to this cause. The result of the successful remedy applied suggests, indeed, another cause. Mr. York added nitrate of baryta to an old bath giving a sandy film and multiplicity of irregular pinholes. The result of this addition was a precipitate, which, when removed by filtration, left the bath in perfect condition, giving plates clean and free from defect. The most legitimate conclusion from the formation of a precipitate on the addition of nitrate of baryta is, that sulphate of silver was present in the bath, and that being decomposed at once on contact with the baryta salt, sulphate of baryta was thrown down, and the bath was so purified of the deleterious matter. Some eight or ten years ago Dr. Vogel traced pinholes to the presence of sulphate of silver, and proposed nitrate of baryta as the remedy, which proved quite successful, the only drawback to its use, found on prolonged trial, being a tendency in the bath to produce over-intensity in the negative. It should be remembered that nitrate of baryta would not precipitate iodide of silver from the bath, nor is there, indeed, any contamination likely to be present in a silver bath except sulphate of silver, which would be thrown down by nitrate of baryta; except so far, indeed, as the definite formation of one precipitate often aids in carrying down other substances which are in suspension or imperfect solution. The tests applied by Mr. York proving the insensitiveness of the precipitate to light, and its insolubility in a solution of iodide of potassium, also favour the probability that it is sulphate of silver.

The ingenious suggestion of Herr Warnerke—based, however, upon experimental examination—that the presence of pinholes is due to fulminate of silver, is worth bearing in mind. With excess of nitric acid and excess of alcohol present, the fulminate of silver may be formed in a bath. But this salt is sensitive to light, and readily blackens, whilst Mr. York's precipitate did not change under the action of light. Pinholes have also been traced to the presence of oxalate of silver in the bath. The suggestion that pinholes are due to the presence of bromide in the bath is not an unnatural one, seeing that since the universal use of bromo-iodized collodion, complaints of the existence of pinholes have been much more rife than formerly. But it must be remembered that the

presence of bromide in the minute crystals causing the pinholes has never been traced, and further that bromide of silver, unlike iodide of silver, is not soluble in solutions of nitrate of silver. Whether a double salt of iodide and bromide of silver may be formed and become the cause of pinholes remains a subject for investigation. It should be remembered that another and perfectly explicable cause for the greater prevalence of pinholes at the present time, than formerly, exists without referring it to the use of bromides. It is admitted that whatever may be the ultimate cause, the immediate cause is the use of an over-worked bath; and there is little doubt that the enormously increased production of negatives in this day, compared with that of (say) sixteen years ago, when the use of bromo-iodized collodion began to obtain, and the probable over-working of baths in consequence, will explain much of the greater prevalence of pinholes now than in former days.

This reference to over-worked baths brings us to the really practical part of the question. As a member observed at the meeting, he had never met with pinholes except in an over-worked bath, and the usually recognized treatment of dilution, sunning, and strengthening, never failed to restore the bath to good condition, and remove the pinholes. Mr. York meets the practical part of the question, again, by describing the satisfactory action of nitrate of baryta, adding five grains to the ounce to the defective bath. His practice of keeping a large quantity of solution in alternate use and rest is also strongly to be commended. Another remedy, described in our columns some time ago, has been found most efficacious. It simply consists in adding a few drops of hydrochloric acid to the bath, by which a precipitate of chloride of silver is formed, which carries down with it the cause of the effect defective, and restores the conditions by which clean and spotless negatives are obtained.

SOME RECENT ADVANCES IN PHOTOGRAPHY.

THE reading of Mr. Spiller's paper before the Society of Arts, on Friday evening last, possessed some special points of interest, beyond those involved in the improvements he recorded. It is only by looking back, and fixing the eye upon well-defined landmarks, that an estimate of the rate of progress can be made. And as in the Society of Arts the Photographic Society had its birth two-and-twenty years ago, the history of the art during that time may be regarded as fairly indicating the character and extent of the advance really made. It is worthy of remark that whilst there has been improvement in every direction, and many actual gains in the shape of discovery and invention connected with various branches of the art, in its main features it remains unchanged. The wet collodion process is still the universal method of producing negatives for all general purposes, and the ordinary method of silver printing in vogue twenty years ago has not yet in any important degree been displaced. That there has been enormous improvement even in these methods, which retain their position with such tenacity, there is little room to doubt; but it is in the various added facilities, in the new processes, and the extended applications of the art, that its secured gains are most manifest, and it is as a record of these that Mr. Spiller's admirable paper possesses especial interest and value.

Without attempting to add anything to Mr. Spiller's excellent resumé there are one or two points in which it is desirable that the statement of facts should be modified. In assigning discoveries and inventions to their originators, Mr. Spiller adopts the wise and just principle of recognizing the primary claims of the worker-out of a process, rather than the intangible claims of those who may have made vague and nebulous suggestions, or made equally vague and unsuccessful experiments. But in referring to the collodio-bromide emulsion process of Messrs. Sayce and

Bolton, it is suggested that this discovery of the process was a sequence upon our own introduction of the collodio-chloride process. So far as we remember, without having facilities at hand for verification, the collodio-chloride and the collodio-bromide processes were introduced as nearly as possible simultaneously. Emulsion processes had been attempted many years before, especially with iodides and bromides; but no successful method of producing negatives with such emulsions had been discovered until the collodio-bromide emulsion process of Messrs. Sayce and Bolton was given to photographers. So far as we have reason to believe, the idea of a collodio-chloride process had not been suggested, except in the frankly confessed failure of M. Gaudin, whose experiments in the production of emulsions, whilst very interesting, did not lead to practical issues.

Referring to the most recent improvement in carbon printing, it is important, duly to appreciate its value, to understand its precise relation to the method which has been in use for the last few years. The difference between the use of a rigid support, and a flexible support, for the film during development, scarcely accurately, we think, indicates the distinction. Mr. Johnson's improvement did not consist simply in introducing a rigid support: in fact, rigidity simply was no part of his claim. It was the introduction of an impervious support, which permitted the tissue to adhere by means of atmospheric pressure, which constituted the real basis of his improvement. So far from a rigid support constituting the real claim of his patent, he also claims in the specification the use of flexible supports, admitting of the same principle of adhesion. But the improvement in Mr. Sawyer's process, as we understand it, is not the use simply of an impervious flexible support, but of an impervious flexible support *with an elastic surface*. He had noticed that a special defect in carbon prints was due to the strain between a surface like that of carbon tissue, expanding when wet, and the unyielding, unelastic surface of glass, zinc, and other rigid supports: hence he felt that if the support to which the tissue was attached could be made as elastic as the tissue itself, and at the same time retain its impervious quality, a great gain in the delicacy of the print would be secured; and his patent transfer paper appears to meet all the wants of the case. All genuinely interested in the progress of photography must hail with satisfaction every step which simplifies the production, and increases the beauty, of the only class of prints of which, up to the present moment, it can be said with any confidence that they are really permanent; and we congratulate Mr. Sawyer on his valuable contribution to the value of the carbon process.

DEVELOPING BROMIDE PLATES.

AT the Photographic Section of the American Institute, Mr. D. C. Chapman described a method of developing bromide plates which, so far as he knew, was novel. It was, however, in point of fact, the method which Col. Wortley and Captain Abney have used for some time for emulsion and other dry plates, and which we have more than once published. It may be interesting to give Mr. Chapman's statement as it appears in *Anthony's Bulletin*. Mr. Chapman, addressing the meeting, said:—

"In making some experiments in dry plates I have fallen upon something which I think is new. It is new to me, at any rate. These are bromide plates: not emulsion, but bath plates. They are made with a Morrison lens, thirty seconds' exposure, and they are all that I could ask for as negatives. I was trying some regular bath plates, developing with silver and pyro, and I had one of these bromide plates in my hand, and did not notice it until after the picture was developed. I was surprised to find that I could develop a bromide plate without any iodide in it with acid pyro and silver, after the first details are brought out by an

alkaline development. I repeated the experiment, and found that I could make a picture in much less time with no danger of fogging, and perfectly clear in the shadows. In these plates the first details were brought out faintly with a strong alkaline solution. If that alkaline solution had been continued on the plate, it would have fogged the image all over; but the details came out readily under that strength of developer. The plate was then washed, and the high lights were just as intense as the shadows, and no more so. It was then treated with a little citric acid, to neutralize the ammonia solution, and strengthened up with pyrogallol acid, tannin, and citric acid; the ordinary developing solution. It intensified as readily and quickly as an iodide plate. I shall in future, with my bromide plates, use that development.

"The great advantage is, that you can use a very strong alkaline developer to start your image, and then there is no danger of fogging afterwards, if you use acid silver to strengthen up the faint image on the plate. You get no pinholes, and the image is perfectly clear in the shadows, and in every respect is all that can be desired.

"I have tried Stillman's developer, in which he used liquid ammonia. My experience with the ammonia is, that it has more tendency to fog. For my standard developer I take twenty grains of carbonate of ammonia, one grain of bromide of potassium, and one ounce of water; that I keep as a stock solution. Take a grain and a half to the ounce of pyrogallol acid—that is the solution for developing—flow that on the plate until you cover it, say, half an ounce. Flow over the plate two or three times after it has been washed with water. Then add three drops of the alkaline solution to that, and flow over the plate again, and the image will appear very quickly. This alkaline developer is left on only long enough to show the image by reflected light, and then the plate is washed quickly, and flowed with a five-grain solution of citric acid, to neutralize the ammonia that may be left in the film. Then re-develop with pyro, tannin, and silver. It strengthens up very readily; perhaps in a minute the whole thing is done."

RECENT ADVANCES IN PHOTOGRAPHIC SCIENCE.

BY JOHN SPILLER, F.C.S.*

IN this room, on the 20th January, 1853, the Photographic Society of London was founded, after a very successful exhibition of photographs had been held under the auspices of the Society of Arts. The then new collodion process, invented by Frederick Scott Archer, had given a great impetus to the study of photography, and was already being widely practised by amateurs, who sought in the newly-formed Society the means of interchanging experiences and discussing their results. Helped by Royal patronage liberally bestowed, and by the zealous working of its early members, the art soon made commendable progress, and the *Journal of the Photographic Society* for the next following years may be consulted as the sole record in England of a history which has in latter times borne fruit such as has rarely been equalled or excelled in other departments of applied science. For some of these improvements, and especially those of recent date, it will be my endeavour to bespeak your attention; taking, as far as time allows, more immediate cognisance of those principles and processes which have served to popularize photography in the present day.

In this effort, let me begin by acknowledging my indebtedness to many friends who have kindly aided me by sending specimens illustrating several of the newest phases of the art. Some of these photographs are shown as notable examples of high artistic merit, including portraits, landscapes, "combination prints," enlargements, and

transparencies; other specimens are either of historical interest, or shown as illustrative examples of particular processes. The programme being somewhat wide for the limits of one lecture, I must hasten to approach my subject under appropriate headings.

Collodion Processes.—Beyond the general recognition of liberal proportions of bromides and more alcohol than formerly used, the composition of photographic collodion cannot be said to have been altered from the practice of former years. Cadmium salts are now in general use as "sensitisers," and more attention is paid to the quality of pyroxyline (or nitro-cellulose) employed, some operators preferring that made from paper, according to the recommendation of Dr. Liesegang and others. The so-called "emulsion processes" are gaining ground from the fact of their enabling us to dispense with the "nitrate bath," the collodio-bromide process of Messrs. Sayce and Bolton leading the way to this improvement. This admirable suggestion is founded upon an earlier observation made by Mr. G. Wharton Simpson, who used a collodio-chloride emulsion for coating paper to be used in the printing process: the leading fact being that chloride (or bromide) of silver may be produced in collodion by double decomposition, so as to furnish a product containing at once all the ingredients ready for immediate use—whether in camera or printing-frame—and which may be kept for lengthened periods without sensible deterioration; since the haloid salt is formed in so finely divided a state that it remains suspended in the collodion as an emulsion. Lieut.-Colonel H. Stuart Wortley advocates the introduction of nitrate of uranium together with the silver, and has published formulæ which are even now on their trial, the advantages claimed being greater sensitiveness combined with special superiority in rendering colour—an effort which Dr. Hermann Vogel believes he has equally secured by tinting the collodion film.

For "dry plates" possessing permanent sensitiveness, the writer claims to have led the way by publishing in 1854, in conjunction with Mr. Crookes,* the first dry-plate process; and although the nitrate of magnesium is no longer employed for this purpose, the possibility of the case was established, and a host of other "preservatives," including the collodio-albumen and gum-gallic processes, are now in daily use, the latest development of this system being the albumen and beer process of Capt. Abney, R.E., which has done such good service in securing photographs of the recent transit of Venus.

Collodion Transparencies and Enlargements.—Collodio-chloride of silver has been used very successfully by Dr. Van Monckhoven for copying and enlargements, and her Majesty's War Department makes good use of the same process for reproductions. As a method of copying faded photographic prints this plan of working has been shown by Mr. H. Baden Pritchard to offer great advantages. Mr. Jabez Hughes, of Ryde, produces "transfer collodion enlargements" by development upon glass, and subsequent transference of the toned collodion film to a sheet of white paper or cardboard, by which excellent results are secured, and great permanence is at the same time guaranteed by the unalterable nature of the materials employed. A similar principle is made use of in the production of photo-enamels, the film being transferred in these cases to surfaces of porcelain or enamelled copper, and subsequently fired. Several operators have brought this process to a state of perfection, and the permanence of these photo-enamels is beyond question.

Mr. Valentine Blanchard has within the last few days described a process of enlargement in which albumenized paper is employed for the production of paper negatives with promise of great results. Mr. Edwards has recently shown some good enlargements, and Messrs. Spencer, Sawyer, Bird, and Co. use the autotype process for the same purpose, where the generally admitted delicacy of

* See before the Society of Arts.

* *Phil. Mag.*, May and August, 1854.

the carbon print is taken advantage of both in securing the intermediate negative, or "transparency," and finished print. The details of this process will be again alluded to under the head of carbon printing. The Woodburytype impression delivered upon glass also furnishes excellent transparencies; but none of these processes give better results than the simple collodion when properly toned, as may be seen in the capital lantern slides of Mr. Frederick York, and the excellent enlarged transparency of the full moon which our worthy Chairman gave me in 1860 as an average sample of his work.

Silver Prints.—The charge of want of permanence brought against the ordinary photographs printed upon paper prepared with the chloride and nitrate of silver is sustained by a mass of evidence, and the fading action is observed to be closely connected with the use of hyposulphites as fixing agents. Much can be done by careful manipulation and by paying great attention to chemical conditions, in the way of overcoming, or reducing to a minimum, the destructive action of sulphur compounds upon the silver which forms the basis of the photograph; foremost amongst needful precautions may be mentioned the use of ammonia or carbonate of ammonia to maintain alkaline conditions in the fixing bath, and this followed by a most careful washing, completed with at least one immersion in hot water. Silver prints subjected to this treatment are to a great extent protected against the chance of fading, especially if preserved in a moderately dry atmosphere or closed portfolios; but there is yet another cause for suspicion whenever albumen has been used for the purpose of imparting a glossy surface to the paper. White of egg is known to contain a certain proportion of sulphur naturally combined with the organic elements, and whenever the albumen undergoes decomposition this sulphur is either in part liberated, or free to act upon the silver. We do not know at present of any sure method of counteracting this evil, but it might be worth while ascertaining how far tannin or carbolic acid, applied in the final stage, renders such organic changes impossible.

Mounting materials and the cardboard itself have often to be tested for impurities, the presence of which may defeat all our previous efforts towards securing the permanence of the silver print, however well it may have been toned, fixed, and washed.

Printing in Carbon or Pigments.—For the reasons just now stated it has become imperative to seek for other means of solar printing, which, dispensing altogether with silver and sulphur, may escape the possible contingencies to which the old process is liable. Uranium printing offers a better chance of permanence, but although experiments have from time to time been made in this direction, the evidence is not yet sufficiently conclusive to warrant an absolute reliance being placed in this mode of working. The necessity for appealing to a chemical process involving the use of a costly metal appears, however, to be mainly disposed of by the fact that so much progress has lately been made in carbon-printing that improvements seem for the present to arise out of the mastering of its details. So far as I am aware there is no instance on record of a faded carbon print, and there is a reasonable ground for believing in the permanence of combinations of gelatine and chromic oxide, which form, as it were, the cementing materials around the particles of carbon (or pigment) composing the graduated shades of the picture. The chemistry of carbon printing is perhaps not yet fully made out, but it has received much attention from Mr. J. W. Swan and others, who have helped forward its practical realization. We all know how unalterable is a sheet of parchment, and yet this is but an untanned film of animal gelatine. It dissolves slowly in boiling water, but resists attack from the ordinary oxidizing influences of the atmosphere. Properly tanned, or indurated with certain metallic salts, it becomes insoluble, and even more indestructible. Indian ink, Frankfort black, and other forms of carbon (including

black lead, used in some experiments by M. Marion) may certainly be depended upon for permanence, and so also may chromic oxide, which for years past has been employed as a pigment. The only question that arises in my mind is that we might perhaps "make assurance doubly sure" by resorting to an after tanning process as I pointed out five years ago.* Let alum and the metallic ingredients do their work as now, and finish in a bath of tannin or other astringent.

Having thus reviewed the chemical question, we must descend to practical details, and learn how a carbon print or "autotype" is usually produced. This I am enabled to place before my hearers with all the advantages of latest improvements, inasmuch as an admirable summary of all that is known upon the subject has just been communicated to the Photographic Society by Mr. J. R. Sawyer, in a paper entitled "Photography in Permanent Pigments, with Recent Improvements in Autotype Transfer."

Mungo Ponton having shown that paper coated with potassium bichromate is affected by light, and Becquerel that the presence of gum or gelatine hastened the change, Poitevin conceived the happy idea of introducing a pigment which, by becoming locked up in the altered gelatine tissue, rendered it possible to obtain a carbon print. This end was secured merely by washing with water to remove the unaffected portions of the chromated surface, leaving insoluble those parts, in gradation, according to the greater or less marked action of the light. William Blair, of Perth, improved this process by directing his operations to the back of the sensitive coating, producing superior results as regards the rendering of half tones, but necessarily obtaining reversed pictures. Mr. J. W. Swan, of Newcastle, greatly improved the process by introducing a system of transfer in which india-rubber paste was employed to turn over the image, so that it could be developed with greater certainty by washing in warm water, and then finally transferring the picture to an appropriate mount. Mr. J. R. Johnson proposed the use of a rigid temporary support, such as a plate of zinc or glass, to receive the pigmented gelatine film and hold it during the process of washing. By employing reversed negatives Mr. Johnson was enabled by "single transfer" to mount the carbon print on a sheet of alumed gelatine paper.

Such was the state of the process when Mr. J. R. Sawyer observed that he could obtain much finer results by discarding the rigid support, and returning to paper specially prepared, which, permitting of extension and contraction during the washing and subsequent drying of the carbon print, or autotype, was not so apt to break the fine lines. Mr. Sawyer's patent "flexible support" is paper treated first with chrome alum and gelatine and allowed to dry; such a coating is insoluble in water, as Mr. Swan had previously shown. Upon this a layer of ordinary gelatine (5 to 10 per cent.) is applied, and then this is coated with a solution made in a digester, as follows:—

Button, or bleached lac	...	...	1 lb.
Water	...	...	5 quarts
Borax	...	...	4 ounces
Soda crystals	...	...	1 ounce.

In order to get a perfectly smooth surface, the paper is subjected to rolling pressure between metal plates, and each sheet at the time of use is rubbed over with resin and turpentine mixed with a little wax. It is not difficult to imagine that a "flexible support," built up in this manner, would act as a soft couch or bed, for the reception of a carbon or pigment print about to be developed, and we readily believe that superior results can, as asserted, be obtained in this way. The final result is transferred to sheets of paper coated with an emulsion of gelatine and

precipitated sulphate of barium, mixed with a little chrome alum.

As the temporary support can be used repeatedly if again rubbed over with the repellent coating of wax and resin, the cost is no bar to its employment, and the process is said to be admirably adapted for amateurs' use. If these bright anticipations are realized, we may shortly hope that carbon will replace silver for all ordinary purposes, and that no more complaints will be heard of fading photographs.

(To be continued.)

PHOTOGRAPHY IN THE PARIS PRISONS.*

It is now some time since the Paris Police availed itself of the aid of photography in securing pictures of those who come under its notice, and there are now two young and skilful operators engaged by the Prefet de Police for fulfilling duties of this kind. The routine labours they have to perform have in no way damped the ardour and energy of these gentlemen, who are to be congratulated on the results already attained under their auspices.

Criminal photography—which made its *debut* under very modest circumstances, and which is now carried on in Paris in a manner scarcely favourable to its full development, the rooms and studio being established behind barred windows on the ground floor of sombre buildings—has many duties to fulfil, for the staff, besides satisfying the wants of the various Police Stations, the House of Detention, Mazas, Saint Lazare, and other prisons, undertakes the portraiture also of subjects in the Morgue.

Those who are acquainted with the aspect of Paris prisons—with the House of Detention, for instance, which is a veritable well, daylight only entering from above—will understand that good apparatus, and especially good lenses, are necessary in the case of criminal photography; and as a fact, we may mention that all the paraphernalia, aplanatic and rapid lenses are French, and bear a name which of itself is sufficient guarantee of the quality of the articles.

We must also render homage to the skill of the operators, who, under the most unfavourable conditions, know how to obtain with rapidity the most excellent negatives, not only from a likeness point of view, but as artistic productions. The photographers of the Prefecture have the rank of inspectors, and the authorities can rely upon their discretion in all matters that come under their notice. The division of labour is pretty nearly the same as in private establishments; only retouching, which is often abused in our best studios, is here almost entirely suppressed, for it is the truth that is wanted before everything. The portraits, however, receive much care in cataloguing and describing, every one having attached to it particulars respecting antecedents, &c., which are drawn up with scrupulous exactness. The advantage of having a portrait of this kind, whether for establishing the identity of an individual who refuses to give up his name, or for arresting or seeking a malefactor, must be obvious to all. By multiplying the copies of a portrait of any individual whom it is desired to find, and distributing the pictures among police-officers and detectives, you naturally enough multiply the chances of finding him.

All prisoners are not photographed, however, for this would be too long a business, and in many instances quite useless. Such a proceeding would, indeed, be abusing the art, although, no doubt, the authorities have a perfect right to secure a picture of all inmates of the prisons. Every dangerous or habitual criminal, or person likely to be one, is, however, photographed, and thus all the habitués of the prisons are included in the police albums. Some of these characters have been honoured by having two portraits taken, one in profile, and one full face, so that there is little chance of their escaping recognition afterwards.

* *Moniteur de la Photographie.*

The reproduction of photographs already in existence is a branch of duty which the police photographers do not overlook, in case they already possess a picture of the person "wanted" which has been obtained from a friend or accomplice.

An illustrated journal recently gave a sketch of a fancy nature, representing a rebellious criminal held down by main force in front of a camera; unable to stir from the spot, the model is depicted making every grimace and contortion possible, and thus he contrives to prevent a natural photograph being taken, which might compromise him hereafter. Such an incident as this never took place in prison, although it may happen often enough that the model does not take kindly to the photographer. But it would be little good a prisoner resisting, for the authorities know very well how to treat refractory patients.

The operation of posing, however, far from being disliked by a prisoner, is often looked upon by him as a treat, for during the quarter of an hour that he is out of his cell, he enjoys a little pure air and daylight, which represents a souvenir or foretaste of liberty. Many, indeed, pose themselves with a degree of coquetry that is perfectly surprising. It is, in fact, scarcely credible that in the courtyard of the House of Detention, a degree less lively than the Valley of the Shadow of Death, wretches of all kinds, robbers and assassins of both sexes, often clad in the vilest rags, should strive to get themselves taken in a graceful position, covering what corporal imperfections they may possess, the results of intemperance, accident, or punishment, and making quite an unparalleled display of vanity. After the House of Detention, the prisons of Mazas and Saint Lazare furnish the most work for the photographers of the Prefecture, and then comes the Morgue, where also a dark room and laboratory are provided.

It is easy to understand the importance of photographing subjects in the Morgue, whether the pictures aid friends in discovering the body, or, after interment of the deceased, indicate where the various bodies have been buried, so that it is some satisfaction to acquaintances who identify the body too late, that they are informed of the resting place of the unfortunate. Many questions of a delicate and confidential nature, which need not be made public, are in this way solved without unnecessary pain to relatives.

Besides criminals and the victims of the Morgue, there is a third class which the police photographers occupy themselves with. There are many indigent strangers wandering about Paris, and when any difficulty occurs with these, and their friends at home have to be communicated with, portraits obviate a great deal of unnecessary expense and trouble. Finally, it is contemplated to photograph the scene of any crime or accident, and such pictures will be added to the instructions given to the prosecutor, who will thus be enabled to supply the jury with much more accurate details of a crime than he would otherwise be in a position to give.

The results already prepared by the police photographers are thoroughly appreciated by the authorities; the portraits of guilty parties and of victims, which have been prepared, have very much facilitated the administration of justice, and the fidelity with which letters, plans, signatures, and documents of all kinds have been copied by photography is invaluable on many occasions. Sometimes application is made by foreign governments for copies of documents and portraits, for the purpose of pursuing a criminal, and in this case it is rare that the French authorities refuse to give their assistance.

In a word, whether it is question of a murder, a fire, a robbery, forgery, or other crimes, political or not, photography comes to the aid of the judge, as it does to the humble policeman. At one time despised, the art to-day forces itself upon public attention; and such is its importance, that it will rapidly come to be one of the best safeguards against crime, seeing that none can escape its crucial observation.

NOTE ON CARBON PRINTING.

BY M. GRAND.*

I DO not suppose I am the only one who has found that if a carbon image developed upon a provisional support is attached to its final basis while still swollen with water, it loses much of its delicate character. It is essential that the image should be quite dry before it is separated from the provisional support. For this reason I have been compelled to reject stearine paper as a support, because I find that the pellicle forming the image becomes detached as soon as the latter dries. Many other supports hold the dry image firmly, and only allow of its removal when alcohol, benzole, and other appropriate solvents are employed; but all of them seem to demand great care in development, especially when the prints are of large size, for otherwise the thicker parts of the picture will be found to leave the support.

I have employed, with much success, as a provisional support for developing a carbon image, paper which has been treated with caseine, the latter being dissolved in dilute ammonia, into which the paper is dipped, being afterwards immersed in an alum bath. Under the influence of the small quantity of ammonia retained by the dry caseine, the latter absorbs some alumina, which renders the caseine perfectly insoluble and impermeable. The carbon tissue is applied under water to this support, and pressed for some minutes with blotting-paper. On development, the image adheres with such force to the caseine that it may be handled and treated as roughly as a good silver print.

The image washed, alumped, and dried, is applied (still under water) against the definite support, which should be faced with gelatine and pressed with blotting-paper. To separate the two papers, it is only necessary to plunge them when dry into ammonia diluted to ten times its volume of water; they are gently moved to and fro, and at the end of a few minutes the caseine dissolving, the two papers separate of themselves, or, at any rate, with very little resistance, exactly as in the first operation of development. The dry image is pure and brilliant, and preserves all its delicacy and half tones.

The advantage of operating in this way consists, above all, in the great adherence of two soluble bodies in aqueous liquids, which is much more powerful than between a soluble body in water, and another body soluble only in a combustible liquid, such as alcohol or benzole.

The solution of caseine for facing the paper should be as viscid as possible, to give the paper the brilliancy of an albumenized material. The caseine should be freed from all greasy globules, and one litre of milk will furnish as much as one hundred and fifty grammes of caseine.

The paper treated with this material is most excellent as the definite support for the image, in case the operator is working with a reversed negative; and I am convinced that any photographer making trial of it in carbon printing will abandon other methods which may be more familiar to him, and which may yield passable results.

I may observe further, that dilute, and even concentrated ammonia, has absolutely no action upon the image, or upon the gelatine in the sizing of the paper.

In reference to this last remark of M. Grand, M. Chardon is of opinion that ammonia has not that innocuous character claimed for it above. According to his experience, ammonia, when contained in water in the proportion of only five per cent., under ordinary circumstances, attacks and destroys the sizing of paper.

* *Bulletin de la Société Française.*

Correspondence.

ENLARGED PAPER NEGATIVES.

MY DEAR SIR,—I am sorry I was not present at the meeting of the London Photographic Society last Tuesday, when Mr. Blanchard read his interesting paper. It is very strange that I have been working the same process for the past three years, in proof of which I send by this post a negative that has been done all three years. I am sure that our old friend Mr. Blanchard will not think for a moment that this is sent in an unkind spirit. I thought that it was original on my part, and I have no doubt he did the same. It is a process of great promise, but to work it successfully there are several points that require making clear, or in ordinary hands it would give a great deal of trouble, and that is why many good and beautiful processes lie buried in the photo. literature of the past.

I can reproduce small carte negatives (same size as original), giving capital results, by making a transparency in another manner. It would be too long to go into the whole details of the process here, as I should wish, but at some future time I hope to be able to give the results of my labours fully in the form of a paper at one of the societies, or an article in the PHOTOGRAPHIC NEWS—that is, as soon as I can find time; but you are well aware that with a professional photographer time is fully employed.

Trusting that Mr. Blanchard will look upon this note with the true friendly feeling that he always displays at our meetings and social gatherings where I have had the pleasure of making his acquaintance,—I am, dear sir, yours very truly,

W. BROOKS.

Stratford Green, E., April 19th.

Proceedings of Societies.

THE SOCIETY OF ARTS.

At a meeting of this Society, held on the evening of Friday last, the 17th inst., Mr. WARREN DE LA RUE, F.R.S., in the chair,

Mr. JOHN SPILLER read a paper on "Recent Advances in Photographic Science" (see p. 200), and exhibited a number of fine examples of the new and improved processes of the last few years.

In the course of the conversational discussion which followed, Mr. BLANCHARD, at the request of the Chairman, gave a detailed description of his method of enlargement recently brought before the Photographic Society.

Mr. J. R. SAWYER gave an interesting explanation and demonstration of his modification in the carbon process.

Mr. J. T. TAYLOR, referring to Dallastype, expressed his opinion that it was a typographical rather than a lithographic process, and Mr. W. NOEL HARTLEY pointed out the analogy between the Woodbury process and the method of nature printing employed by Mr. Henry Bradbury some years previously.

Dr. W. J. RUSSELL would like to have heard more definite information about the chemical action of chromate on gelatine under the influence of sunlight. He was inclined to believe that the carbon print was permanent, whereas albumen was one of the worst foundations for a photographic record, since it was so difficult to purify, and always contained sulphur.

The CHAIRMAN, in moving a vote of thanks, regarded with satisfaction the present condition and future prospects of the art, and pointed out some of its astronomical and scientific uses.

The vote being duly acknowledged, the proceedings terminated.

Talk in the Studio.

INDIAN MEDALS.—Our readers will learn with pleasure that Mr. William Bedford, son of Mr. Francis Bedford, has received the Viceroy's gold medal at the Bengal Photographic Exhibition for the best landscape.

DILUTE ACETIC ACID BEFORE TONING.—In referring to the common use in America of acetic acid in the washing water for prints prior to toning, a few weeks ago, by a printer's error

the word "drachm" was printed for "drop." Our attention is called to this matter in a courteous letter by Messrs. Anthony and Co., of New York, who remark that from ten to fifteen drops of glacial acetic acid to a quart of water will be quite sufficient, and that bleaching will be apt to follow the use of a stronger solution.

EXTORTION BY PHOTOGRAPHY.—The *Magpie*, a new humorous and satirical magazine published at Tunbridge Wells, which promises to take rank amongst the best of its witty contemporaries, has the following on a form of offence which we hope is very rare:—"Speaking of photography reminds us of a new dodge for extorting money out of innocent people. A painter, or employer of painters—for it is not certain that he paints himself—procures the photograph of some likely lady or gentleman, and gets up a showy enlarged copy of it in oil or water colours. The next proceeding is to invite the victim to look at the picture. This is done in the most courteous terms, and the subsequent proceedings are carried on in the most bland and oily manner, until the person interested, who has, of course, refused to purchase at the exorbitant price demanded for the picture, receives an intimation that if he, or she, still declines to accept the picture at the price, it will be publicly exhibited. In the case of a lady the dodge is pretty sure to succeed. The game must play itself out in time, and the ingenious 'crimp' find his reward."

"When once we practice to deceive,
We little know the web we weave."

The only safeguard people have against this annoyance is, when they want their portraits taken, to go to a respectable photographer, who will resist the temptation of selling copies to unauthorized persons."

NEW VOLUMETRIC METHOD OF DETERMINING SILVER.—J. Volhard gives, in the *Bulletin* of the French Chemical Society, some details of a volumetric method of estimating silver:—"The alkaline sulpho-cyanides produce in salts of silver a clotty precipitate as insoluble in water as the chloride of silver. The red solution of ferric sulpho-cyanide produces the same precipitate, and is decolorized at the same time. If sulpho-cyanide of potassium or ammonium is added to the solution of a silver salt mixed with a ferric salt, a red colouration appears, which is immediately discoloured, and does not become permanent until all the silver is precipitated. This indication is extremely sensitive, and the amount of silver is easily deduced from the quantity of sulpho-cyanide solution consumed in producing a permanent colouration if the strength of the sulpho-cyanide is known. This method is much more sensitive than that of Mohr, who employs chromate of potash as indicator, and can be used for the determination of all bodies which are completely precipitated by nitrate of silver from an acid solution. It is merely requisite to add nitrate of silver in excess, and determine the excess of silver remaining after precipitation. To prepare the standard solution of sulpho-cyanide of ammonium—a salt too hygroscopic to be weighed directly—we dissolve about eight grammes in a litre of water. On the other hand, ten grammes of fine silver (or 10.8 if the solution is to correspond to the atomic weight) is dissolved in nitric acid, and diluted with water to 1000 c. c. To 10 c. c. of this solution add 5 c. c. of ferric sulphate (at 60 grammes Fe_2O_3 per litre), and dilute with 150 to 200 c. c. of water. The sulpho-cyanide solution is then dropped in with a burette till a permanent red colouration appears. If, e. g., 9.6 c. c. of the sulpho-cyanide have been required, 960 c. c. of this solution are then diluted to make up one litre, when each c. c. will correspond to 10 milligrammes of silver. To assay an alloy of silver one gramme is dissolved in nitric acid, the solution evaporated in the water bath, 5 c. c. of ferric sulphate and 200 c. c. of water added, and the sulpho-cyanide run in. Every 1-10th of a c. c. used expresses 1-100th of silver. The presence of copper within certain limits is without influence. If it amounts to 80 per cent., the precise point of saturation is difficult to seize, either because the blue colour masks the red colouration, or because the cupric solution has an action upon the sulpho-cyanide. It will be necessary to ascertain if the sulpho-cyanide undergoes any change in keeping, and if the presence of certain metals renders the result doubtful. Finally, this method requires simplifying for alloys rich in copper and poor in silver. This simplification may be found, perhaps, in the following reaction:—When to a mixed solution of copper and silver ferro-cyanide of potassium is added, the brown precipitate of ferro-cyanide of copper does not appear till all the copper has been thrown down."

To Correspondents.

ALAN CLARKE.—The yellow spots are due to hypo. They have all the appearance of spots caused by imperfect fixation, in which insoluble hyposulphite of silver is formed in the print owing to the use of a weak or worn-out fixing bath, or imperfect immersion of the print in a strong fixing bath. But if, as you state, the spots appeared before fixing, they are due to the print having been brought into contact with hypo before fixing; probably the blotting-paper of which you speak has been contaminated with hypo by some means.

A. B. C.—For general purposes the rapid, beyond a question.

SUBSCRIBER.—So far as we know and believe, all the pictures you mention are copyright. The presence of photographic copies in the market freely advertised for sale does not in any degree prove or suggest that the pictures are not copyright. In the case in question the right of photographing has been purchased of the owner of the copyright, and hence the photographs are published under the copyright.

R. EVANS.—You will find in our advertising columns the addresses of several gentlemen who undertake to give lessons, from whom, of course, you will be able to obtain particulars of terms, &c., on application.

C. A. M. W.—The number you received was forwarded from the publishing office, though not enclosed in the usual wrapper.

NORTHUMBERLAND.—The marking on the piece of sensitized paper you enclose is caused by the formation of air-bubbles between the paper and the solution. The remedy is greater care in placing the paper on the surface of the solution. If you have any reason to fear that a bubble has been formed, the sheets should be raised again immediately, the bubble removed, and the paper replaced on the surface of the bath. Condensed steam from an engine is not always pure, and not safe to use for distilled water in photography.

B. SLADE.—If this gentleman will forward his address to us, we will furnish it to a former customer, who wishes to communicate with him about a portrait.

J. T. F.—y.—In the first chapter of the "Practical Printer," in which the term *sal soda* is used, we explained that it was the American term for common carbonate of soda, used in the household in this country as "washing soda."

T. E. H.—We do not know the addresses of the makers of fans and other fancy mounts for photographs. It is very probable that you will find them advertised in the "Stationer," a monthly journal published by Dean and Son, Johnson's Court, Fleet Street. 2. Mr. Fry's article on his mode of enlargement appeared some time ago.

ROWLAND LEIGH.—Novelties in photographic apparatus are frequently shown at the autumn exhibition of the Photographic Society, but only recent novelties. A few hours spent in visiting the establishments of London manufacturers and dealers would afford the best opportunity of seeing various examples of apparatus.

BAFFLED.—Try reducing the exposure considerably, and using a weaker developer of (say) six grains protosulphate of iron to the ounce, and twenty minims of acetic acid. It is probable that you have been trying new and thin samples of collodion. Very often, under such circumstances, the addition of a grain or two of soluble cotton to each ounce of collodion proves effective. The addition of a trace of gelatine to each ounce of developer often proves useful in such cases. 2. In producing carbon transparencies on glass you will find a preliminary coating of collodion useful.

M. D. L.—The markings on your sensitive paper are what are commonly known as "tear-drops," and arise from drops of the silver solution remaining in isolated spots on the surface of the paper, instead of draining off in a steady wave, and drying evenly. The tendency to do this may arise from two causes: sometimes, but not frequently, from the use of a too strong silver bath; most frequently from the paper having been kept in a very dry place, so that the albumen surface has become hard, horny, and repellent. The remedy consists in avoiding the causes; but when the tear-drops appear whilst the paper is drying, they may be removed by blotting-paper.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

GIBBONS' PHOTOGRAPHIC COMPANY, GIBBONS'.

Two Photographs of Mr. Richard Ord.

MR. W. BAKER, Stockton-on-Tees.

Photograph of St. Paul's Viaduct at Cleveland.

MR. R. E. O'DELL, Birmingham.

Three Photographs of Mummies in Cases.

MR. CAREY, Swansea.

Three Photographs of Mr. Thomas Halliday.

The Photographic News, April 30, 1875.**PHOTOGRAPHY IN AND OUT OF THE STUDIO.****PHOTOGRAPHY FOR PHYSICIANS.—GERMAN PHOTOGRAPHIC LITERATURE.—TOUGH GLASS.**

Photography for Physicians.—There is nothing new in being able to photograph the invisible, for it has long been known that the photographic lens perceives much that is passed over by the human eye. In the violet end of the spectrum, for instance, there are lines and double lines whose existence was not known to spectroscopic observers until photographers came and fitted a camera to the eyepiece of the instrument, and thus secured a record of things which previously were not known to exist. Until Dr. Vogel made known his discovery last year, it was thought, too, that there were some lines of the spectrum visible to the eye and invisible to the camera; but this appears not to be the case, for so long as a suitable collodion plate is employed, any of the lines of the spectrum may be reproduced, whether they are in the provinces of the violet or the orange. A little while ago we called attention to a very useful application of the camera in photographing the invisible which is made use of in Paris at the Bank of France, by M. Gobert, a photographer attached to that establishment. When erasures had been made upon cheques, for instance, the quick eye of the lens often discovered the obliterated word, which was quite invisible to the eye, and thus aided in the detection of fraud and robbery. Any one who has copied a carte which has been enclosed in a letter knows how much more vigorous marks upon it resulting from contact with the writing come out in the copy than they are in the original; indeed we have sometimes been able to read writing thus printed off from a letter in the copy, but not in the original. Those who occupy themselves with photolithography, or the reproduction of maps and sketches, know, too, how annoying it sometimes is to find big patches over their plate which were altogether invisible upon the original, a closer investigation showing a rougher texture in these places, or faint yellow stains that would, under ordinary circumstances, escape notice. It is now suggested, by Dr. Vogel, we believe, that physicians might employ photography with advantage for the purpose of forming a diagnosis of a case, for if we are to believe some statements which have recently been made, the art would aid the medical man considerably in coming to a decision. Thus a circumstance is mentioned of a woman who, though ailing at the time, decided upon having a portrait taken. Although, apparently, her features and face were free from any eruption, the negative showed spots all over the face, and within a day or two the model was found to be suffering from a severe attack of small-pox. Now if the camera can perceive these spots before the eye discerns them, it is obvious that a photographic plate may at times be an important assistance to medical science, as it has been for many other of the sciences already. In registering the different forms of disease, and illustrating characteristics thereof, the camera is already freely used by medical men, and it will only be necessary to call their attention to this new method of employing it to ensure a trial of its capabilities in this direction. For the purposes of medical instruction at schools and colleges photographic diagrams are now largely used, the preparations being enlarged under the micro-camera, and then further amplified in a lantern. In this way a good deal of microscopic work may be avoided, and a demonstration can be made much clearer than when the student does not enjoy the benefit of the professor's assistance when looking through the microscope. The medical profession are therefore fully alive to the value of photography, and it is by no means impossible that a camera, or adaptation of it of some kind, may in a little while be deemed as im-

portant a medical instrument as the stethoscope of the present day.

German Photographic Literature.—Germany is to have a weekly photographic journal, and the first number of the new paper is now in our hands, dated April 3rd, 1875. Its title is the *Photographisches Wochen-Blatt*, and the editor is Karl Schwieler, of Weimar, who for some time assisted Dr. Vogel in his photographic laboratory at Berlin, and who was one of the chief photographers attached to the Prussian staff before Strasburg and Paris during the recent Franco-German war. It is impossible to judge of the merits of the new journal from the first number, but it is matter for surprise that so extensive a country as the Vaterland, should not have possessed a weekly journal before this. However, from the circumstance that both *Helios* of Dresden, and *Licht* of Berlin, came to an abrupt end last year, one cannot say much in favour of the prospects of photographic literature just now, and we believe that the only two periodicals in North Germany at present are the *Mittheilungen* of Berlin, and the *Archiv* of Elberfeld. In South Germany there are also two, the *Correspondenz* and the *Notizen*. The *Wochen-Blatt* does not profess to be the organ of any society, but will maintain an independent footing, and although its editor resides at Weimar, the paper will be published in Berlin.

Tough Glass.—The important invention of rendering glass tough is attracting attention everywhere, for brittleness has hitherto been the main drawback which has prevented the use of the material in many ways. Glass has so many qualities to recommend it for use: it is transparent, scarcely ever attacked by chemicals, has no corrosive action upon other bodies, and is altogether a most agreeable and cleanly material. The new tough glass is not, however, faultless; it cannot be worked into shapes, neither can it be bored or ground any more than a diamond; so that if it were desired to have photographic plates of the material, these would have to be made the proper size at first, for they could not be cut or fashioned after the glass has been toughened. As regards its appearance, the tough glass is not to be distinguished from ordinary glass, for it is just as transparent and pure as the ordinary material. The method of toughening appears to be a secret, and takes place during the cooling of the material. It is said that the inventor has demanded a sum equal to one franc per head upon the whole population of Germany for the process, which would amount to the respectable sum of forty million francs; but this demand is altogether too exorbitant. Many chemists are engaged in experimenting in order to find out the key to the problem, and Professor Bauer, of Vienna, seems to be in a fair way of discovering the secret, having already produced a hardened glass which is not brittle, and which will withstand a high temperature. Professor Bauer's method of working is to place ordinary glass in a furnace until heated to 500° to 600° Cent., and then to lower the temperature by dipping the mass into hot paraffin, so that the glass shows a temperature of 400° C. Subsequently the mass is gradually allowed to cool down to 40°.

RECENT ADVANCES IN PHOTOGRAPHIC SCIENCE.

BY JOHN SPILLER, F.C.S.*

Photography in the Printing Press.—Of late years great advances have been made in this interesting development of photo-chemistry, and there are now several distinct principles of working, which under varying circumstances are capable of meeting the object in view. The reproduction of maps, plans, line engravings, and subjects destitute of half-tone, presents no difficulty whatever, any one of

the photo-lithographic processes lending itself to this purpose, and invariably producing satisfactory results. Mr. Butter, of Woolwich Arsenal, has executed a large series of plates illustrating military equipment. Mr. Griggs has done some admirable work for the India Office, including patterns of Cashmere shawls, &c., involving the use of colours. Major-General Sir Henry James and the Topographical Department at Southampton, working by a modification called photo-zincography, are reproducing the Ordnance maps; and the Chatham establishment is doing very similar work by a process devised by Captain Abney, R.E., which has been patented under the name of Papyrotype.* The Dallastype, Kerography of W. J. Linton, the Electro-Photography of Chas. Hancock, probably come into this division, but no details of these processes have ever been published, although the results in some instances have been highly satisfactory.

The simplest form of photo-lithography is that in which a sheet of paper prepared with gelatine and chromate is exposed to light under a negative, next uniformly coated with a thin layer of litho-ink supplied from the ordinary inking-roller, then submitted to the action of warm gum-water to loosen the attachment of the unaltered gelatine, and with it the superimposed greasy ink, which, washed away, leaves a transfer ready to be laid down upon the lithographic stone. Great care is requisite to prevent abrasion and injury to the design in the process of developing the transfer; but, this point attended to, it is manifest that the ink adheres permanently only to those portions which have been hardened and rendered insoluble by the action of light, and these are in turn transferred to give the design upon the stone.

Another class of processes includes those employing a layer of chromated gelatine, which, by the action of light, exhibits a different rate of water-absorption according to the depth or extent of the indurating action induced by the solar exposure, and in these we have true gradations of tone.

The first in this category was Paul Pretsch's photo-galvanography, which, aided by the encouragement and assistance given by the Chairman and Dr. Hugo Muller, certainly paved the way for greater results. Pretsch's first English patent is dated November 9th, 1854; he described his process here in April, 1856, and specimen prints were afterwards issued with Nos. 89 and 103 of the *Photographic Journal*. Mr. R. H. Courtney's process of later date is very similar.† The general principle was to expose to light a film of chromated gelatine (under the negative) for just such a period of time as would suffice to bring out clearly the effect of relief when afterwards sponged with water. A cast was taken in gutta-percha or plaster of Paris of the whole surface, which exhibited depressions corresponding to the intensity of light-action, and then from this cast an electrotpe was made which could be printed from like any ordinary surface block.

Omitting the successive steps in the history of photo-mechanical printing, we come now to the latest examples of work in this class as exhibited in the Albertype, and the collographic process of Messrs. Spencer, Sawyer, Bird, and Co. A grand step in the way of progress was presented in 1869, by Herr Joseph Albert, of Munich, whose invention was rewarded a year later by the Photographic Society's Medal. In these specimens the gradation in tone is perfect, and we know that an immense number of impressions may be printed from the same plate without appreciable loss of delicacy. The mode of proceeding is somewhat as follows:—A thick glass plate is levelled and flooded with a liberal supply of chromated gelatine, which when set is exposed to light under a negative; the upper surface is then acted upon by water and an astringent to give at once a printing block. By the judicious use of gum-resins a certain quality or texture known as "stipple"

is imparted to the surface, and the ink applied with a roller for each impression. The "Utrecht Psalter" reproduced for the Paleographical Society, coins in the national collections (Numismatical Society), Thomson's "China" (4 vols.), and Mundy's "New Zealand" may be quoted as examples of recent work executed by the English firm already mentioned; whilst a kindred process, the Heliotype, has served to illustrate Mr. Plimsoll's work, "Our Seamen; an Appeal."

Woodburytype.—Having had the privilege of bringing the first specimens of this process to the notice of the scientific world, at the Dundee meeting of the British Association, 1867, I felt great interest in inspecting last week some of the most recent examples of the Woodbury process, and for a certain class of work where rapid production is imperative the results leave little to be desired. Mr. Downey's portraits of H.I.M. the Shah were published by thousands within a week of the negatives being taken, and the regular appearance of the illustrations in the "Figaro Programme" (weekly), and the "London Sketch Book" (monthly), attest to the practical success of the process. The details are now so well-known that a brief description suffices. Mr. Woodbury works the chromated gelatine for the purpose of obtaining a hard insoluble film on development, which he terms "gelatine relief." With this a plain block of type metal is impressed by contact under enormous hydraulic pressure, which, singular to relate, does not crush the matrix. The mould or printing block thus produced is then served with a warm gelatinous ink, the paper laid on the top, and the excess of pigment squeezed out, which leaves the desired impression, requiring only to be fixed in an alum bath.

The gelatine relief gives admirable casts in plaster of Paris, which form a pleasing mode of reproducing microscopic objects, and these also were shown at Dundee, but as yet little practical use seems to have been made of the idea.

In conclusion, I must ask your indulgence for many shortcomings in this attempt to bring a very large subject within the scope of a single lecture, and I beg to refer you to Mr. Henry Blackburn's account* for a correct estimate of the artistic importance of these processes of reproduction—the joint efforts of chemistry and photography to satisfy one of the wants of the age.

PHOTOGRAPHY IN PERMANENT PIGMENTS, WITH RECENT IMPROVEMENTS IN AUTOTYPE TRANSFER.

BY J. R. SAWYER.†

To Mr. J. R. Johnson we are indebted for the invention of a method of double transfer, doing away with the india-rubber coated paper, and which went a very long way towards making the process simple and easily workable. His method is based upon the fact that if two impervious surfaces are pressed into contact, and the air entirely removed from between them, they will adhere, by virtue of atmospheric pressure, without the necessity of using any cement or adhesive material at all. Here we have a distinctly new principle, which Mr. Johnson applied as follows:—The pigmented tissue being printed, it was immersed in water, and when it had become just limp was laid down upon a plate of metal, glass, slate, or other impervious body. This were called the rigid temporary support. The air and water were pressed from between these two surfaces by means of a sort of india-rubber edge fixed into wood, and known as a squeegee. The two surfaces so forced into contact were allowed to remain for a few minutes, then placed in the hot water, which, dissolving the layer of soluble gelatine immediately in contact with the paper, allowed the paper to be stripped away, the back of the

* "Instructions in Photography" by Capt. Abney, R.E., p. 122.
† *Journal of the Photographic Society*, vol. xv., p. 5.

+ The Art of Popular Illustration.—*Journal of the Society of Arts*, March 12th.

• Continued from page 186.

picture consequently exposed, and the conditions for successful development fulfilled.

The problem of how to produce permanent photographs with ease seemed now to have received a satisfactory solution. The operations were not difficult, they required no costly apparatus, the materials employed were not expensive. Why, then, did not this improvement at once give rise to a vast development in the direction of permanent photography? Mr. Johnson had, it is true, patented his invention; but it had been practically thrown open to all comers—the only conditions being that the tissue and material used should be purchased of the company formed to prosecute the enterprise.

In Autotype printing the standard of excellence to be attained has been the exquisite though fleeting beauty of a silver print. These productions are eminently beautiful; the toning with compounds of the precious metals gives a variety of rich, beautiful colouring. The paper upon which the photograph is printed is of a very fine quality, and the finished picture is susceptible of a very high glaze and finish. It is not improbable that for small pictures, Autotypes made by this process of double transfer did not present that delicacy and finish which would make them acceptable to the profession and to the public.

With large work the reverse was the case. For reproductions of paintings, drawings, sketches, engravings (especially of a large size), this process at once showed its superiority; for besides the value attaching to these productions by reason of their permanent character, there was an additional element of satisfaction in the fact that they reproduced not only the colour of the originals, but in many cases the very material in which the original was worked. Thus the *facsimile* of a drawing in red chalk would be reproduced in a tissue having red chalk for its pigment, and similarly with respect to other colours.

And now another step forward was made. It will be remembered that prints from ordinary negatives appear reversed, and need another transfer to cause them to appear in their correct relation. To save time and trouble, it was considered desirable to reverse the negatives; and in copying pictures, works of art, and those objects to which Autotype printing seemed particularly to lend itself, this was accomplished by means of the reversing-mirror.

This proceeding reduced the number of operations to a minimum, and a great success was at once achieved by those who adopted this method of producing their negatives.

Printing from reversed negatives is known as the operation of "single transfer," and is conducted as follows:—The only materials required are the pigmented tissue and a paper coated with insoluble gelatine known as "single transfer-paper." When the tissue has been printed under the negative it is immersed in cold water, together with a piece of single-transfer-paper rather larger than itself. These are brought into contact under water, lifted out together, laid upon a slab of slate or piece of sheet zinc, and pressed into contact with the squeegee; allowed to remain for a few minutes, then placed in warm water. The soluble gelatine at the back of the picture soon begins to dissolve, releases its support (the paper), which is stripped off and thrown aside. The development is continued, and when complete the picture is rinsed in cold water and placed for a few minutes in a weak solution of alum, which indurates the gelatine. It is then rinsed in the cold water, hung up to dry, and when dry is ready to trim and mount.

It is apparent that the operation just described cannot well be more simple; and for small pictures it was found that there was always a more crisp definition and sharpness of line than could be obtained by the transfer from a rigid surface. To discover why this should be the case was the next problem.

It occurred to me that the cause was to be found in the yielding nature of the support upon which the picture was

developed—namely, the transfer-paper. It will be remembered that in the process just described the printed tissue and transfer-paper were put into contact in a moist condition, consequently they expanded or contracted together—there was no strain between the two surfaces; but if a limp and yielding surface like wetted tissue is laid upon an absolutely rigid support, such as a plate of zinc or porcelain, is it not likely that there will be a strain set up between the two surfaces by reason of the contraction of the damp tissue as it partially dries? and will not this be of itself quite sufficient to impair the delicacy and crisp detail of small photographs? Mr. J. R. Johnson had suggested the use of a paper coated with an ammoniacal solution of lac; but dealing, as he did, mostly with large work, he did not insist upon its value as a yielding surface, even if he were aware of the fact. Taking, then, the idea that the superior quality of pictures produced by the single transfer process from reversed negatives was due to the soft and yielding film upon which they were imposed for the purposes of development, I endeavoured to discover if some such basis could not be found for prints from ordinary negatives; the material to be perfectly soft and yielding when wet, to receive the limp tissue as it were on a soft *couche* or bed, to retain it perfectly during development, and, finally, to give it up easily when the development was completed. After many experiments and repeated failures, I at last hit upon a combination that, after a very long practical trial, seems to answer perfectly: and the ease with which it is manipulated is not the least portion of its merit.

This tissue, which I have named "flexible support," and for which I have obtained a patent, is paper treated first with a coating of gelatine rendered insoluble by means of chrome alum; this, when dry, is coated with a solution made by dissolving (at a high temperature) lac by means of borax and soda.

The coating of gelatine forms the bed or *couche* upon which the picture is held during development, the lac being the resisting coating which enables the print to leave the surface when finally transferred.

The mode of preparing the flexible support is this:—A solution of gelatine is made of variable strength, according to the quality of surface desired in the finished print: for a print to have a dead or matt surface, I employ about a five per cent. solution, for a more highly glazed surface about 7½ per cent., and for a surface about equal to highly glazed albumenized paper a ten per cent. solution. Paper wound upon a reel, so as to be in a long length, is coated upon a carbon-tissue-making machine with these solutions, and when dry is cut into sheets and subjected to a pressure of many tons in an hydraulic press. The solution of lac is made by dissolving one pound of button or bleached lac in five quarts of water, in which has been dissolved four ounces of borax and one ounce of soda: this is put into what is called a digester, and heated until the lac is dissolved; the solution is then filtered, and when cold is ready for use. The gelatinized paper is floated upon this solution in a shallow bath or tray, hung up to dry, and then finally rolled between metal plates in a rolling-press; each sheet is rubbed over with a little of a solution made by dissolving resin in turpentine, and adding thereto a few grains of wax. This was employed by Mr. Johnson to rub over his rigid support to prevent final adhesion, and was, I believe, used by Firling in a very early stage of carbon printing. As soon as the spirit has evaporated, the "flexible support" is ready for use.

The mode of using is extremely simple: after the tissue has left the frame, it is plunged into water with a piece of the flexible support a little larger than itself; the two surfaces are brought into contact under water, avoiding air-bubbles, lifted out together, and hung up in the air for a period which may vary from ten minutes to one or two hours, as may suit the convenience of the operator. The adhering sheets are then plunged into warm water

and the paper upon which the tissue was made peels off. The picture is developed, and when finished is slipped into cold water, thence into the alum bath, and after rinsing is ready for the final transfer.

The material upon which the picture finally rests is paper coated with gelatine containing sulphate of baryta as an emulsion in the solution, and rendered partially insoluble with chrome alum. Pieces of this paper are cut to the proper size, and immersed in hot water to soften the gelatine; the picture to be transferred is placed in contact under cold water, the two are lifted out together, hung up to dry, and when dry the finished picture leaves its temporary support with the greatest ease.

The temporary support may be used repeatedly, by rubbing it over with a little of the repellent solution of resin and wax, and will last a very long time. I hope to convince you by practical demonstration that the process is very simple, very easy, not liable to failure, and that the results are such as will bear comparison with the best work of the silver printer; whilst if I can convince you that these productions are "things of beauty," I can assure you they will be "joys for ever."

THE PRACTICAL PRINTER IN AMERICA. XXII.

ARTISTIC TONING.

As a rule, in toning the prints, the following will, as a general thing, answer admirably: "tone the prints just as you wish them to be when done." Looking over a journal one day, in my earliest days at printing, I saw an article headed "Artistic Toning," and upon reading it I learned several things about toning, and one little clause was the one above quoted. This clause seemed to me to be very important to the young printer, and I wondered at the time why I had never been told that, and I immediately knew, upon reading the above clause, that I could tone, and so I determined to tone a batch of prints as soon as possible, and one rainy afternoon, when the printer did not appear after he went to dinner, I resolved to do the toning myself without saying a word to the employer about it. So I made the bath as I had seen the printer make it a score of times before, warmed it slightly, let stand a few minutes, put, washed, and acidified the prints, washed again, and then commenced to tone them, toning three at a time, and as there were only fifty to be toned, being all that had been printed on account of the darkness of the day and the scarcity of the negatives, I did not doubt but what I could tone and fix them all without help. This was the first batch of prints that I ever had the complete management of the toning and fixing of, and I determined to let Mr. L., the employer, and Mr. B., the printer, know that I could tone. With anxious eyes I watched that first batch of prints—in fact, I glared at them—and when they arrived at that stage at which I wished them to be when finished, I took them out and set them to washing in running water. When my next batch of prints was almost toned, I placed in the bath a print that was not toned, and compared the two, upon doing which I found that I could tone much better. I toned them all finally, fixed, and set to washing. When through, the "boss" happened to think that there was "no toner upstairs" (so he expressed it, as I afterwards found out), and he came rushing up where I was to tone the prints before it got much darker, for the weather was lowering, and it was getting dark pretty fast. I told him that I had toned, and he expressed his surprise, and inquired, "Are any of them good?" a question which I did not think very complimentary, I assure you. I told him that I thought quite a number of them were good, and when he, upon looking at them, told me that they were "very nice indeed," I felt bigger at the time than I ever have since. I asked the printer, Mr. B., the next morning how the prints were toned, and he said, "Very well, only they were toned a

little uneven," and upon his showing me what he meant, I determined, as a natural consequence, to do better next time. That little clause led me on, in time, to do the toning in that and other establishments, and more for the reason of showing a young beginner what he can do by a little reading of how another beginner did, has led me to write this short sketch of my first attempt at toning.

From the above you see that the idea in toning is to tone the prints until they look as you wish them to when finished, and that toning, in one respect, is not a question of time, as fixing is, for you remember that the printer, when he fixes his prints, makes up his solution of a certain strength, which he makes sure of by tasting, and then he times them, and lets them remain in the bath so many minutes. Now the toner, who takes five minutes or so to tone a batch of prints, would give the impression to the beginner that it was a question of so many minutes, as it is in fixing prints, consequently I have here taken special pains to contradict this erroneous thought, so as to prevent the novice from beginning wrongly, as he would be apt to do if he was in a place where the printer or printers would not take any pains to show him, but would be constantly on the hurry to get through as soon as possible.

Now, since you are to tone the prints as you wish them to look when finished, let us see if you have the right idea in your mind as to how they should look when toned.

You should not wish to have them what may be called "red tones"—i.e., to have the background, draperies, hair, and the face as red as a brick, or, in fact, anywhere near it. You should not tone them so that the draperies and shadows look blue. Rule:—You should tone until the face is slightly blue, and then the prints should be taken out, even if the rest of the printed paper is quite red. With some baths—especially such ones as the "acetate of soda," and the bath described last in the preceding chapter—this can be done very easily and successfully; but there are some baths, as the citric acid, chloride of lime, &c., that this treatment cannot be used so well, and in the case of the "citric acid toning bath" the shadows also will have to be regarded, else the whole print will be as red as a brick.

But a little experience in toning with any one bath will give you an idea as to how far you should tone before you discontinue the operation and set the prints to washing. You may say that which I have just written will conflict with the rule given above, but it does not; for the only difference is this: with one bath you can tone full strong, and with another one, when the proper state has arrived, the prints should immediately be removed, and should not be allowed to remain in the bath until the tone has reached the more decided stage. In baths containing either the acetate or the chloride of sodium, or both, in their composition, the above rule should be strictly carried out. The beginner should also bear in mind that he should endeavour to tone even. By toning even I mean, to tone all prints of the same person alike.

Some of my readers might say it means to tone the whole batch of prints to the same tone or tint. Now I suppose that this could be followed out, but would it be called "artistic toning" to tone blondes, blondines, and brunettes all the same tint, and make the light hair in one print red when it is not, black hair in another one red, and red hair black, &c.? You may say that red hair takes black, which it surely does, but if it lies in the power of the toner to tone the hair red, at least a little so, should he not do so? Another person may have black hair: should not the toner get a good dark-brown tone on the print, so as to make the hair look black (which it will do when the print is dry), and thus make the print more in keeping with the original? Should not a blonde have her hair look light in tone, and neither red nor brown, but about somewhere half-way between? The negatives of the last-mentioned class of subjects are generally so made that when you tone the face as per rule given above, the hair will be all right. So it is generally in by far the

majority of cases, the yellow and red hair being exceptions. Of course, you cannot obtain, and I doubt if you wish to, yellow tones for the hair; but if such hair is taken nicely in the negative it will very often come round to the right tint in the print, without making the rest of the print appear at all yellow, but of a light-brown tint. While writing this I have in my hand such a print, wherein the hair is of a faint yellow tint, and the draperies, background, &c., are of a rich brown tone. I have obtained many such tones as this one by the use of the "citric acid toning bath." Excellent tones for the red hair, with clear high-lights and half-tints in the face, are easily obtained with a bath containing chloride of sodium in its composition. The young beginner might obtain a few ideas by the close perusal of the preceding chapter about toning-baths.

You might say that it is a difficult thing for a toner to tone his prints in the style spoken of above, and also that he cannot tell when the hair should be a decided red, black, or medium, on account of his never having seen the original. For this reason it is advised by some photographers that the operator should do the toning, as he knows more about the "style of beauty" than the printer, who never sees the original. As far as lies in the printer's power he should tone the prints as near as he can to their proper colour, and his guide should be the original. A lady who was the possessor of "lovely (?) auburn hair," once said to a photographer, "Why, you have made my hair jet black, when it was auburn!" "Yes, said a friend, "they have made your lovely hair black, sure enough!" Red hair was the fashion at that time. I know of many first-class photographers that dislike the red tones for the reason, as I have heard them say, that "they are not artistic."

There is a great diversity of opinion among first-class photographers about the proper kind of tones to be obtained, as many of us are aware. I myself have always admired the German portrait stereographs, the tones of many of which, I think, are perfect. It is not only in the portrait work that this toning is to be so observed, but it should be more so in landscapes, marine views, &c. Always tone them more than what you would portraits, as red tones on views are abominable, and then by toning them a rich brown the finished print will look as the views do in nature, and trees, rocky bluffs, fences, wood-piles, water, logs in water, reflections in the water, steamers, &c., will all be delineated in the print with wonderful fidelity.

Weak prints should be toned in a very weak toning bath, as when the bath is very nearly exhausted, and face up in the solution. Intense or hard prints should be toned quite quickly in a strong bath, and face down in the solution. Prints face up in the toning bath tone slower than when face down. Weak prints, in all solutions, should be subjected to mild treatment. A black tone is obtained by toning full strong in almost any bath if it contains a trace of chloride of lime. A chocolate tone is obtained by toning a little longer than what you would for a red tone, in almost any bath except the chloride of lime bath, and sometimes it can be obtained in this bath in a greater or less degree, according to the quality of the negatives. A decided brown tone is obtained by toning a trifle longer than what you would do to obtain a chocolate tone. To obtain a purple tone you should tone between a chocolate and a brown until the print commences to show the least possible signs of this tone, then take it from the bath and fix and wash, and when it is finally all finished it will be purplish in tint. The "sal soda bath" is excellent for these kind of tones, and they are quite easy to obtain, especially if the prints are strong, bold, and possess good toning qualities. A "nitrate of uranium bath" is also excellent. A blue tone is obtained by almost any bath, but a good, clear, and pretty blue is a little harder to obtain, unless the negatives from which the prints were printed are excellent ones, containing good

toning qualities. The "bicarbonate of soda" is an excellent bath to obtain rich blue tones.

All of the above tones are obtained more by removing a print at certain stages of the toning from the solution than by any particular bath, although some baths may be better than others for producing particular tones. It is in a great measure, however, simply a matter of taste and experience.

PHYSICAL PROPERTIES OF COLLODION FILMS.

BY M. E. GRIFON.*

If a film of collodion is poured upon the surface of a very clean glass plate, it may be separated from the glass, after drying, in the form of a very thin transparent sheet which can be placed in a frame. This membrane, with its polished surface, reflects light in the same way as glass; it polarises light both by reflection and transmission. The maximum angle of polarisation is $33^{\circ}35'$, reckoned from the surface, or $55^{\circ}25'$ normal. From this we deduce that, according to the law of Brewster, collodion has an index of refraction, $n=1.51081$, which is rather higher than that of crown glass.

It is possible, with the aid of this index, and by observing the displacement of the fringes of interference produced by a membrane of this kind, to calculate the thickness thereof. The films experimented upon were thus found to have a thickness less than .01 of a millimetre, the numbers varying from .0081 to .0088.

Through this extremely thin screen the membrane of collodion allows a large proportion of radiating heat to pass. Taking as the sources of heat, sometimes the flame of a moderator lamp, sometimes that of a candle placed in the focus of a metallic reflector, and maintained at a constant height, it was found that the membrane allowed 0.91 of the luminous heat to pass. When a blackened can of boiling water was taken as the source, then the proportion of heat which was transmitted was not more than 0.70. If the can were maintained at a temperature of 50°C ., only 0.50 of the heat passed, and this amount did not sensibly decrease when the temperature of the source was 20 degrees less. When two films of collodion were placed in the track of the heat emanating from a can heated to 100°C ., the amount of heat transmitted was 0.583; the first transmitted 0.70 of the heat, and the second film allowed 0.80 of the heat which traversed the first screen to pass through it.

It is possible to form polarisers by means of collodion films. They may serve both for light and for heat. At the same time it must only be employed with precaution with solar light, for the films are apt to break when submitted to an excess of tension. The polarisers are formed by cementing collodion films upon tiny plates of zinc cut in the form of frames, superposing and inclining the sheets of collodion at an angle of $30^{\circ}35'$ upon the direction of the rays. They have a transparency much superior to mica, which is usually employed in researches upon heat. If the polarisers are more fragile than those made from mica, they are, on the other hand, more easily repaired.

If two instruments, each composed of six films, are placed to intercept the heat rays, it will be found that those crossed, in which the planes of incidence are perpendicular, only allow 0.66 part of the heat transmitted by the parallel instruments to go through. By placing nine films before a Nicol's prism, and noting the deviations of the galvanometer when the principal section of the prism is parallel or perpendicular to the plane of polarisation of the films, it is found that the polarised heat composes 0.6 to 0.7 of the pencil transmitted.

The facility with which anybody may construct polarising instruments, and the superiority of these in some respects over those of mica, will, the author thinks, justify their employment in heat investigation.

* *Comptes Rendus.*

The Photographic News.

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POISONING BY BICHROMATES.

WE have more than once called attention to the poisonous action of salts of chromic acid, whether taken internally or absorbed through the skin. A recent case described in the *British Medical Journal* by Mr. Louis Lewis, M.R.C.S., again calls attention to the importance of caution in relation to the toxic qualities of a substance now familiarly used in photography. In the case in question an operator mistook the yellow-looking solution for pale ale, and took a good draught before he discovered his mistake. Fortunately, medical aid was speedily obtained, and by the prompt administration of sulphate of zinc, till vomiting and purgation had been induced, and subsequent exhibition of olive oil, the patient recovered, remaining, however, very weak for some time, the stomach tolerating the blandest food only.

It may be useful and interesting here to repeat some details we gave in our volume on printing in pigments, on the poisonous action of bichromates generally. Most of our readers know that, taken internally, they are active poisons; but, fortunately, up to the present time, few cases appear to have occurred, or, at any rate, to have been placed on record. Dr. Cloet, who made a careful investigation into the condition of health of the people engaged in a bichromate manufactory, states that, taken internally, it is not poisonous in such minute doses as cyanide of potassium, about fifteen grains being necessary to cause death in a healthy adult person; but it is in coming in contact with the mucous membrane, or with a slight abrasion of the skin, that its most injurious action is found—obstinate and dangerous ulcerations, issuing occasionally in complete destruction of the part, ensuing. It is to be observed that when used with care, no danger whatever need be apprehended, as it is quite innocuous on the skin when there is no abrasion; no absorption of the poison taking place, except by the mucous membrane, or through a wound of some kind. The important point for photographers to observe is, to avoid contact with the bichromate where there is any scratch or lesion of the skin, and to avoid contact with the eyes or nostrils with fingers which have recently touched the chromic salt. Dr. Cloet says:—

This salt (bichromate of potash), in small doses—say a few grains—acts as a purgative; in larger doses—say fifteen grains—it acts as a poison. A workman in a factory put some bichromate into a barrel of cider, by way of joke. The cider was rendered dark in colour, but still the other workmen drank of it, and were all affected with severe colic and diarrhoea. Disease of the nostril has been produced by workmen who, having stained their fingers with the salt, have put them into the nostril.

In transforming neutral chromate of potassa into bichromate,

by means of acid, the vapour arising carries with it an infinity of pulverulent molecules of the product, which spread through the workshop. This cloud of particles is easily visible in a ray of sunlight. The molecules inspired give a bitter and very disagreeable taste to the palate; but as profuse salivation is the result, the chromate is thrown off in the saliva, and has not time to inflict any permanent injury. If, however, respiration be made through the nose, the molecules are dissolved in the layer of secretion which lies on the membrane, creating a violent pricking, suffusion of tears, and irresistible sneezing. In time, the membrane begins to be thrown off, and portions of it are carried into the handkerchief used in blowing the nose. This process, when once started, goes on so rapidly, that after a period of six or eight days the septum becomes thin, permeated with openings, and is ultimately detached altogether. Snuff-takers escape this evil.

On the skin, in its normal state, and intact, the bichromate exercises no baleful influence; the hand may, in fact, be plunged into a hot concentrated solution of the salt without fear; the hand may also be covered with the salt for an entire day without any observed effect; but if the skin is torn or abraded, however triflingly—by the prick of a pin, for example—a sharp pain is felt on contact of the salt, and if it be left in contact with the wound, the caustic character of the salt is brought out intensely, the cutaneous tissue is decomposed, and violent inflammation is established. These symptoms are accompanied with intense pain, especially in winter, when the cold is severe. The action of the salt does not cease until the cauterization has penetrated to the bone.

When the skin is abraded, and the bichromate has produced ulceration, the best treatment is to wash the part thoroughly with a feebly alkaline water; then, if inflammatory action follows, to poultice, and afterwards freely apply subacetate of lead in solution.

Dr. Taylor recommends, for cases where the poison has been taken internally, emetics and carbonate of magnesia or chalk, mixed with water into the consistency of cream.

A NON-INVERTED IMAGE WHILST FOCUSING.

THE old proverb says that use is second nature; but there are some things to which it is possible to become perfectly accustomed without ever feeling them natural or pleasant. One of these is the inverted image of the sitter seen on the ground glass whilst focussing. The portraitist becomes familiar with it, and regards it as inevitable; to the discomfort he may become reconciled, but he is scarcely aware of the extent to which the image turned upside down limits his opportunity of estimating the pictorial effect of a multitude of details, which may be of great importance in the final result. Mr. Joseph Byrne, an ingenious photographer at Margate, has not only felt the trouble, discomfort, and other disadvantages involved, but has provided a remedy. The "Rectoprion," as he designates his invention, is a mirror of polished silver, with framework to attach it to the back of the camera and adjust it to any required position in relation to the ground glass, the image thrown upon which is received in a non-inverted position on the Rectoprion. The effect is surprisingly pleasant and charming: on the perfectly-reflecting surface is seen the upright image, apparently more brilliant than it is on the ground glass; and as it is laid flat before the eyes, it affords the utmost facility for examining the image with a minuteness impossible before, and with a degree of comfort scarcely to be imagined. The sharpness of every object in the picture becomes easy to examine, and the composition and arrangement are all clearly placed before the eyes, as in an ordinary picture, materially conducing to the production of higher art qualities, as well as securing a comfort and ease in focussing hitherto unknown. Mr. C. E. Elliott is agent for Mr. Byrne's clever invention.

THE "HARROGATE REST."

THE head-rest has been, from the earliest days of photographic portraiture, regarded by the public as an instrument of torture—not simply a terror to moving sitters, and a

praise to those who sit well, but an engine of oppression which the malignant photographer applied with Procrustean uniformity to all his victims, protest and entreaty being alike impotent in securing immunity from its iron grip. "Please do not screw me up!" "I can sit still without that iron thing!" "It was that vice which held my head caused me to move!" and a score of similar protests and remarks are familiar to the portraitist, who has, however, generally been quite satisfied that the use of the rest was imperative to prevent moving. But it is unfortunately true that the head-rest has been, for many years, more or less an instrument of torture; and, what is worse, it has often been destructive of ease and grace in position, and a foe to happy natural expression, as well as a bugbear to sitters. The old stiff unyielding rod of iron too often rendered it necessary to place the sitter to suit the rest, rather than to bring the means of rest and support to the natural position of the sitter. The true theory of the rest is suggested by its name. An easy, natural, graceful position having been secured, a support or "rest" is required just at that part of the head or body which will give comfort and steadiness. To meet every position of the sitter, the utmost pliability in the rest is necessary; and this must be secured without loss of firmness and rigidity, and without unnecessary complication. All the changes of position should be easily made, but absolutely firm support must at the same time be secured.

Considerable improvement in such rests has of late years been made; but the "Harrogate Rest," in its present perfected form, which has been submitted to our attention by Messrs. Harvey, Reynolds, and Co., seems to approach nearest to perfection, having regard to all the requirements of the sitter and the photographer, which we have seen. It is firm and rigid without being cumbersome, and possesses the utmost pliability and adaptability to every position of the model, standing or sitting, without being at all complex. Every change of position is easily made and as easily and firmly secured, head and body each receiving comfortable support, not constraint, in almost any position of standing or sitting. A curved slot in the main pillar permits a lateral movement of the rest without disturbing the base, and also permits the rest to be thrown out of the upright, to accommodate leaning or stooping figures, occasionally required in groups and pictorial photography. In short, the rest, being once placed in a moderately suitable position beside the sitter, will not require to be moved about to accommodate slight changes in position; but, after the model is satisfactorily posed, the several portions of the rest can be quietly brought into contact, and firmly fixed, without the slightest discomfort to the sitter, to whom it will be really a stay and comfort, rather than the irritating source of constraint so often, and not unjustly, objugated.

Critical Notices.

TREASURE SPOTS OF THE WORLD: A Selection of the Chief Beauties and Wonders of Nature and Art. Edited by WALTER B. WOODBURY. Containing Twenty-eight Splendid Photographs. (London: Ward, Lock, and Tyler.)

IN the handsomely got up quarto volume before us Mr. Woodbury's chief aim appears to have been to bring together in one volume a score and a half of pretty photographs of beautiful or interesting places, and so form a useful gift book. There is no connection or sequence in either text or illustrations. A "Street in Cairo" is followed by a "River Scene in Java," that by an Interior of a Mosque in Cordova, and so on; the short detached descriptive chapters by different pens being also without connection or sequence. But this somewhat desultory character is really an element of value in a book intended for the drawing room table, as it makes no demand on

continuous reading, whilst it will aid in rendering agreeable many a *mauvaise quart d'heure*. The photographs are for the most part good ones, well printed by the photo-relief process; and the brief chapters attached give generally sufficient details to increase the interest of the pictures.

FUNNY FOLKS: A Weekly Budget of Funny Pictures, Funny Notes, Funny Jokes, Funny Stories. Nos. 1 to 20. (London: James Henderson.)

THIS successful, although comparatively new, competitor for the smiles of the public claims notice in a photographic journal on the double ground that photography plays an important part in the numerous very fine illustrations, and the comic aspects of photography are frequently made subject of good-humoured fun in the new journal. We strongly commend it to our readers as one of the cheapest and best yet issued of the mirth-compelling weeklies. Here is an extract which will amuse our readers:—

"THE WHISTLING PHOTO."

"But the mouth's whistling. You can almost hear it!"

So every one says when I show them Matt Jones's photograph. And the thing's so droll they can't help laughing over it, and wanting to know how it came about. So I may as well set down the story, once for all.

It was a hot July day, and our village was baking in the sun. The heat made us all lazy and dozy, and on the look out for anything that might happen; when all of a sudden the whole place was woke up.

There was a hearse on the Green!

We couldn't believe our eyes. Nobody was dead. There hadn't been a funeral thereabouts for six months. What did it mean? Nobody had an idea. But there was the hearse. No mistake about it. And what made it the more surprising was that the horse in the shafts was white, with spots like wafers all over it—not what undertakers mostly like.

You may be sure we flocked out to see what it all meant, and a white-faced man in a black cloak, who was fitting the nose-bag on, looked up, bright and smiling, as we gathered about him.

"So it's drawn you, has it?" he said, quite pleasantly.

"What d'ye mean by 'drawed us'?" demanded the landlord of our inn—the Blue Boy and Spud.

"Ha, ha!" cried the pale man, throwing off the black cloak. "I'm an artist, I am, and I've got to draw my customers before I photograph 'em. Now there's nothing fetches 'em out like this travelling convenience"—pointing to the hearse. "Whenever they see it in any village, they're sure something's up; and as it seems to be a weakness o' human natur' to take an interest in seeing friends and relatives buried off and got out of the way, I'm never long in getting round me an intelligent and enlightened assembly like that to which I have now the honour of submitting specimens of my art. 'Alf-a-crown—shilling—sixpence.'"

He had taken from under his cloak, as he was speaking, small photographs in cases, and now handed them round. Then he proceeded to open the door of the hearse, and to drag therefrom a camera, the stand for it, and a number of articles useful in his art.

"Handy, you see," he remarked, still in reference to the hearse, "to carry things in, as well as to attract with, and the best thing in the world for a dark room—the original one, in fact."

Talking on, he had by this time rigged up his camera, brought out the little box with the prepared plates in it, and was ready for a customer. We were taken with the humour of the man, but all a little shy. But out comes Matt Jones from the Blue Boy, striding along with that vicious bull-terrier of his at his heels.

"I'm on, man," says he—"fire away!"

"Certainly, sir, certainly," says the pale man, looking about with an air of business; "take the camp-stool, sir, and sit here—just here; that'll do. Steady!"

He laid his hands on Jones's big broad shoulders to get him into position, and as he did so an ominous growl from the bull-terrier was audible.

"Lie down, Growler!" cried Jones, and the growl subsided.

The artist retreated to the camera, made his preparations, and was ready to begin. His head disappeared under the black cloth.

"Now, sir," said he, reappearing, and throwing himself into an attitude, "please to fix your eyes on this point—so—that's it—a little more straight—that's it. Now, perfectly still, please, till I tell you."

The expression which at that moment came into Jones's face was curious to behold. He was afraid to move his head, but even without doing so he could perceive a suggestive movement on the part of Growler. He saw that treacherous beast, who seemed from the first to have taken a mortal hatred to the artist, stealthily advancing toward the thrust-back calf of that individual, who stood watch in hand. It was a critical moment. Jones didn't like

to spoil the chance of a good likeness by calling out "Down, Growler!" and for the same reason he didn't care to let the beast fix on to the tempting calf. A compromise suggested itself. He gave a low whistle, without moving his lips, as he believed, and the dog hesitated; he ventured on a louder, and the brute glared at him; a louder yet, and he slunk back.

"But the artist had seen the lips twist."

"Confound it, sir!" he cried out, raising his arms in a passion, your whistling'll spoil all, you!"

A yell ended the sentence. Growler had spoilt it. Believing that an assault on his master was meditated, he had darted forward and fixed his teeth in the plumpest part of the tempting calf. Down went the artist, down came the camera, forward darted Jones, and the men, the dog, and the smashed apparatus were all mixed up in one wild struggle on the ground. It was a minute or more before Growler could be beaten off, and when his victim was released from his fangs he was not in a state to take more portraits that day.

Next morning the beast was gone, and, strangely enough, has never been seen there since.

But Jones had secured his picture—his mouth distorted with the whistle in it; and there it hangs in the bar of the Blue Boy and Spud, known to everybody as the "Whistling Photo."

FRENCH CORRESPONDENCE.

DUOS DU HAURON'S HELIOCHROMIC PROCESS—VANDER WYDE'S NEW METHOD OF LIGHTING—BOUVIN AND VIDAL'S PHOTOGRAPHIC MANUALS.

WHILE M. Leon Vidal is preparing for the practical working of his heliochromic process in the establishment of the *Moniteur Universel*, M. Ducos du Hauron, whose name is also familiar to your readers as a worker in the same direction, is continuing to improve his own special method. On the 5th inst. he presented to the Agen Society of Science and Arts a memoir in which he gives a resumé of his labours for the past six months. As regards the manner of producing the three negatives which serve in securing the three monochrome prints, he has made but little material alteration; he has substituted aurine for the coralline which entered into the composition of the collodion, and rendered it sensitive to the red and green rays. As to the pigmented papers, yellow, red, and blue, which he employs for the production of his prints, M. Ducos du Hauron prepares them in the manner following:—

In making the red paper, he dissolves ten grammes of carmine in a litre of ammonia, which is poured into a green bath. After some hours, when the ammonia has evaporated so as to leave scarcely any odour behind, he adds rain water in sufficient quantity to fill up the original measure again. Then he takes sixty-five cubic centimetres of the solution, adds thirty-five cub. cents. of rain water, allows about fifteen grammes of very soluble gelatine to soak in the same for an hour, adds one gramme of sugar, and makes a solution of the above in a water bath heated to 50° or 60° Cent. He then filters the mixture, still warmed by the water bath; and, finally, he pours into a graduated glass measure the quantity of mixture necessary to cover the sheet of paper, the latter being put upon a glass plate previously to the mixture being poured over it. When the gelatine has set, the paper is taken from the glass plate, and put to dry in a stove, the temperature of which varies from 18° to 25° Cent. To prevent the paper from contracting, it is placed, whilst drying, between a pad of blotting-paper and a wooden frame, the weight of which is sufficient to maintain it in a flat condition.

To prepare the yellow pigmented tissue, M. Ducos du Hauron pounds in a mortar twenty-five grammes of clear chrome yellow (water colour), adding by degrees rain-water until there is a litre of liquid. Into one hundred cub. cents of this liquid (which is shaken up before it is used) is put fifteen grammes of gelatine and one gramme of sugar; and, after this has remained for an hour, you proceed exactly as above.

For the Prussian blue pigment paper, M. Ducos simply employs the permanent blue ink of commerce (15 cub. cents. in 55 c. c. of rain water), and he proceeds to treat this in exactly the same manner as the red and yellow pigments.

The three papers thus prepared are sensitized in a bath composed of 100 grammes of bichromate of potash reduced to powder, dissolved in a litre of water. A little ammonia is added by degrees, the mixture being stirred the while until the dark-yellow colour of the solution becomes suddenly clear. To be quite sure that the whole of the bichromate of potash is combined with the ammonia, an excess of the latter is added, the odour of which indicates when there is no further combination taking place. According as the weather is warmer or colder, twenty to fifty grammes of sugar are added to the bath per litre of solution.

The period of immersion of the pigmented paper in the sensitizing bath varies also with the temperature of the locality in which the operation takes place, the gelatine absorbing far more liquid in a given time in hot than in cold weather. The immersion should take from two to five minutes.

When the pigmented tissue has been printed under one of the negatives, it is covered with a slight film of normal collodion (five decigrammes of pyroxilin dissolved in 100 cub. centimetres of a mixture of ether and alcohol), and after desiccation the sheet is plunged into a cold water bath, at the bottom of which is placed a glass plate covered with a thin film of wax. The glass and the paper are withdrawn together, the gelatinized side of the latter being in contact with the waxed surface, and their perfect adherence is further assured by employing an Indian-rubber squeegee. After they have been in contact for a few minutes the glass and the paper are plunged into water moderately warm contained in a zinc bath placed upon an oven. The paper soon becomes detached, and the developed image remains upon the glass.

To transport successively to the same sheet of paper the three monochromes, red, blue, and yellow thus obtained on three different glasses, M. Ducos proceeds as follows. An alcohol bath is first prepared by mixing two parts by volume of alcohol at 34° with one part of water. This solution is poured into a horizontal bath, and a glass plate bearing the yellow monochrome images is plunged into it, together with a sheet of gelatinized paper; after a few minutes the glass is taken out, together with the sheet of paper, maintained in contact by one of the edges, so that on leaving the water the image adheres to the gelatine facing. A rubber squeegee makes adherence more complete, and after it is thoroughly dry the image adhering to the paper leaves the glass plate. If the separation is not effected at once, however, the glass plate is slightly warmed, when the yellow image detaches itself with ease by lifting one of the corners.

To dissolve away the collodion and the traces of wax adhering to the monochromes, these are immersed for an instant in an alcohol and ether bath. When the ether and alcohol absorbed by the paper have evaporated, M. Ducos proceeds to the application of the yellow monochrome to the blue one. To do this, he immerses in the alcohol bath of 60°, which has already been employed in the process, the glass carrying the blue monochrome, and the paper bearing the yellow monochrome; after a few minutes they are withdrawn together from the liquid, the operation being then proceeded with as above. In this case, however, it is necessary to pay attention that the outlines of the objects coincide; this is done by looking at the prints as transparencies, and drawing one gradually over the other, an operation that is facilitated by the circumstance that one print is upon paper, and the other upon glass. The superposition thus established, the adherence is effected in the same way as before, and afterwards the third monochrome image, the red one, is superposed on the other two in the same way. The compound print is finally mounted on Bristol board; but before this last operation it is well to immerse the image for a few minutes in an alum bath, which, among other advantages, has that of rendering the carmine perfectly permanent. The paper which serves for the definite support should be well faced

with gelatine, and for this purpose a ten per cent. solution is used.

The mode of printing which has just been described may, as M. Ducos du Hauron observes, be applied to the production of heliochromes upon glass—that is to say, vitrines, stained windows, and the like. To secure pictures of this kind it is only necessary, after having produced a heliochrome upon paper, to immerse it in an alcohol bath as above, and to ensure adherence in the way already described, the glass having previously received a very thin film of gelatine treated in alum.

It is obvious that the whole series of operations here described is very ingenious, and evidently M. Ducos du Hauron has made much progress since his first publications on the subject. The matter, however, is still somewhat complicated, and requires important simplifications before it can be worked practically. We know, too, well, that the intelligence and activity of the inventor will speedily overcome the difficulties that now attend the operations, and which at present render any industrial use of the process impossible.

I received this week a visit from Mr. Vander Weyde, who desires to make known to French photographers his new method of lighting studios. He is already in communication with one of our principal portraitists for the establishment of a model studio where his patent may be worked and exploited. The invention, of which he has already communicated to me the principal points, is a most ingenious one, and it will, I think, prove very successful.

M. Ernest Boivin, of Mans, whose communications I have on several occasions reproduced in these columns, is going to produce a work very shortly which will certainly be well received by photographers, for it will contain a resumé of the progress which has lately taken place in the production of negatives by the dry-plate process, and in printing in carbon. These are both of them subjects which are at present pregnant with importance, and in presenting operators with a summary of the improvements accomplished recently in these two branches of the art, M. Boivin will render a sensible service.

It appears that M. Leon Vidal is also engaged in preparing a new and enlarged edition of his excellent manual of carbon printing.

ERNEST LACAN.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER II.

THE manipulations of the dark room are so important, and their success is dependent on so many apparently trivial circumstances, that it will be well for us to consider, while on the subject of this department, how to secure a room as nearly perfect as possible. In many cases, of course, the room is already set out and fitted up according to the ideas of some former tenant; or, if building for yourself, it may be found that your ideas must be modified considerably to suit the accommodation at your disposal. It is my plan to give an idea for a dark-room as it should be, and leave it to the intelligence of the reader to follow it with such modifications as circumstances demand, or his ingenuity devise.

It should certainly be in the immediate vicinity of the skylight, for quickness and success of working; and this consideration should outweigh many even grave objections to its immediately adjoining the glass house. So many dark rooms are to be found that are thoroughly unadapted to the purpose for which they are designed (?), that if the reader has ever attempted to work in them he will recognise the great necessity for placing it certainly on the same floor as the glass house, and easy of access.

The room should be wholly lined with wood closely fitted, and without crack or aperture to admit actinic light. Its ceiling and walls should be painted in oil, to allow of dust and dirt being wiped off as occasion may require. Do not fall into the fond error that shelves are

“so handy.” A shelf for the plate-holders, one for the glass plates and collodion pouring-bottles, and one handy to the sink for the developer and strengthening solutions, are as many as you require; others only harbour dust, and tempt you to make use of the dark room as a common receptacle for rubbish. Everything like chemicals, bottles, old negatives, &c., &c., must be banished—*everything* but that immediately appertaining to your work. Dust is one of your most insidious enemies, therefore you paint your walls and ceiling, because paint does not retain it so readily as paper and rough wood, and is easily cleaned, consequently you are not constantly troubled with dust falling from walls and ceiling. For the same reason you have only those shelves you absolutely require, they being easily kept clean, and you are not tempted to bring round you a choice collection of rubbish.

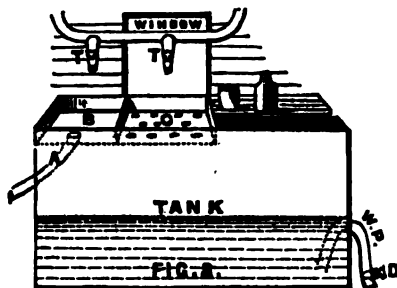
The size of the room is a very important consideration. Let it be as small as possible, consistent with comfort; one eight feet by ten or eleven ought to be ample for almost any amount of work. This room should be kept most scrupulously clean, and for this purpose a mop should be used every morning to clean the floor. Sweeping is objectionable, as it raises dust that troubles you long after the operation. A sash about two feet square, glazed with orange yellow glass, should be let in immediately over the tank, the light of which allows you to watch the development of your plate. See that this window is neither too high, rendering it useless, nor too low for comfort, so as to make you stoop and bend over it. Comfort and health are things which should be studied in photography, at least, as there is quite enough to try the patience and constitution. The sash is to be provided with glass or shutters, light frames covered with yellow paper, that may be easily let down to cover the window when it is necessary to shut out a portion of the light. By all means have a window which is openable when not in use, for the purpose of ventilating the apartment.

Where it is not possible to have a window at which to develop, the only thing left to you is to have a shaded gas-burner fixed a little lower than the level of the plate in your hand. The shelf for the plate-holders should be covered with several thicknesses of blotting-paper to catch any drippings of silver (which should be few) from the plates. These sheets are preserved when they are taken up as being dirty or full of silver, to be sent to the assayer to extract the silver, and fresh ones put in their place.

The tank should be of sufficient capacity for a day's work, that all the washings may be kept till the end of the day to be precipitated, and to allow of the clear water to be drawn off the first thing in the morning. The tank may stand about three feet high, and rest on the floor, eighteen inches in width, so that the window, the illumination of which aids you in determining the development, may not be too far off, and as long as you can spare space for. The water with which you wash off the developer at the point of proper delineation is admitted from a reservoir by a pipe holding the tap placed conveniently under control, which should admit of a clear and plentiful stream running without spluttering. There should also be fixed another tap with a little tray, independent of the main tank, at which you can wash the negative when fixed, *the soda or cyanide washings being carried away without passing into the tank.* But of this, further when the subject of manipulation engages our attention. The tank should be fixed with a false bottom, making a tray eighteen inches deep for the reception of used glasses. This false bottom is perforated with holes, through which the water runs, leaving the tray dry; below is fitted a waste pipe let into the tank about a foot from the bottom, the end inside the tank being carried down to within two inches of the bottom, by which means, in letting off the waste, the silver deposit at the bottom of the tank is not disturbed. Of course it will be seen that for this pipe to empty the tank to the level of the end inside the tank it must be lowered on the outside of the same level fitted with a tap, that the wash-

ings may be retained till they can be precipitated with a saturated solution of copperas, a common salt of iron.

The accompanying little sketch will explain the arrangement of the tank, which must of course be perfectly watertight. T T are the taps at which the negative is washed;



that over tray C for the negative after development, the washings running into the tank; and the tap T over tray marked B, for washing the negative after fixation, the washings of which run away down the pipe indicated (A) on the left of the diagram. The pipe on the right (W P) is the waste pipe of the tank, the tap (D) at the bottom retaining the contents of the tank till it has been precipitated with the saturated solution of copperas.

The dark room should be kept as nearly as possible at an even, comfortable temperature all the year round, as much for the sake of the work as of the worker. A little stove should be fitted in the winter to warm the room to about 60°, and in summer the operator should seek by means of ventilation to keep the thermometer from ranging into the eighties and nineties.

Much trouble is saved, and good order assured, by having an apartment appropriated to the purpose of a

CHEMICAL ROOM,

in which to boil baths, clean and albumenize glass (if you decide on accepting my suggestions in favour of this latter operation), and for keeping chemicals, bottles, graduates, funnels, &c., &c. A small cupboard may be fitted for the reception of the various chemicals; separate utensils, bottles, and funnels should be used for the various solutions, and should be kept to their proper use. Let all your bottles be kept clean, and be neatly labelled.

THE WOODBURY PROCESS.

BY W. E. BATHO.*

THE process I am about to describe is one which it is my firm conviction is destined to play a most important part in the future of photography. As a discovery it will rank in importance next to that of the collodion process, and will link the name of Woodbury with those of our greatest discoverers. In printing operations it will ultimately prove as great a boon as collodion did in the negative processes of old.

The principles involved in the process are few and simple, and they ought to prove a lesson to us as to what may be produced with genius from apparently insignificant means.

The keystone of the Woodburytype is a fact well known to us all, and has proved to be the starting-point of more printing processes than I could enumerate in the time at my disposal. I refer to the circumstance that gelatine and other analogous substances, when a bichromate is added thereto, become insoluble under the influence of light.

A moment's reflection on this will show that a layer of such a bichromatized gelatine will, after the unequal action of light and subsequent solution of the soluble portions, present a film of varying thickness. Suppose, for instance, I had a film of this nature, and upon it I placed, say, a penny (an article, by the way, more familiar than a five-pound note), and then exposed the whole to the action of light: clearly, all the portions but that covered by the coin would have become insoluble; and were I to dissolve away this

covered portion I should have as a result a hollow disc corresponding in size to a penny, and, as a matter of course, raised portions all round. Now this action is found to bear an exact but inverse relation to the density of the negative: in other words, the action is greatest in the parts under the clear portions of the negative, less under the half-tones, and so on, until the parts protected by opacity are totally unacted upon. Thus not only would a negative be represented on such a film or tissue in raised and sunken portions, but these elevations and hollows would also bear a perfect relation in relief to the shadows and lights of the negative.

As this may aptly be termed the "backbone" of the process, I will proceed to enter more minutely therein under the heading of the "relief." A bichromate is intimately mixed with a quantity of gelatine and water, and this is poured upon talc as a support, and dried. This, as you will perceive, is similar to sensitized carbon tissue minus the colouring matter. With talc as a substitute for the paper the use of the transparent support will soon be obvious; other media beside talc may be, and are, used. The drying of these films is a troublesome operation; but, let this process once come fairly into play, and a little pressure on the dealers will bring into the market a tissue with paper as a support to be sensitized, dried, and developed like a carbon print.

We will now suppose ourselves in possession of a tissue of this kind on talc, and want to know the means for printing the same. You are all aware of the necessity for developing from the back in the case of carbon printing in order to preserve half-tone, and as we are dealing with similar materials it would be a waste of time to point out the necessity of the same rule being observed here. The use of the talc now appears. Being transparent it enables you to print from the back, and thus save transferring; so we will suppose the talc and gelatine placed in contact with the negative, from which it is desired to obtain the relief. Now comes a most important point—one which, unless attention be paid to it, will bring about certain failure. I can best illustrate it in a manner familiar to us all. When it is desired to print a vignette, to produce this effect a piece of cardboard with a suitable aperture therein must be used. We all know the result of placing it in the direct rays of the sun. You obtain thereby a tolerably sharp counterpart on your sensitized paper of the opening in the cardboard, with your picture, perhaps, struggling in at one side—an effect which cannot be pronounced either neat or gaudy; yet, when the same arrangement is printed in diffused light—or, as it is termed, "in the shade"—a quite different effect is the result. How is this? It is not difficult to explain, and, ill, indeed, would it become me to attempt to explain an effect the cause of which is so obvious.

Now let us return to our negative with the sensitized film in contact, and examine it. Obviously the gelatine has an appreciable thickness, and parts of the relief are, therefore, formed at some distance from the negative. Your attention need not be drawn to this circumstance to see that if diffused light were used for printing a relief, the result would be more or less indistinct, and hence only parallel rays must be used in order to obtain a sharp image. This condition may be complied with if you print in the sun, of course keeping out diffused light. Artificial light may be employed. Mr. Woodbury used the electric light, which, however, will be found costly to fit up, besides increasing the exposure considerably. Whichever way the relief is produced the effect after development is such as you now have in your hands.

We now proceed to the production of the mould. At first electrotyping was employed; but this was superseded by the discovery of Mr. Woodbury that hydraulic pressure might be used. The delicate gelatine relief is placed in contact with a plate of metal, and these, placed between two perfectly true steel plates, are then placed in a press and subjected to a pressure of about four tons per square inch. It is my opinion that it is here where the chief difficulty hitherto operating in the non-application of this

* Read before the West Riding of Yorkshire Photographic Society.

method of printing is to be found. The hydraulic press is a piece of apparatus few, indeed, would add to their plant. If ever the photo-relief process becomes generally employed, one of two things must take place; either some firm will undertake to make the moulds, or some method better suited for general application must be employed. To this latter point we will devote a little time. Casting in wax, sulphur, and other analogous bodies, is not to be despised. A gentleman (whose name I am sorry I cannot now give) some time ago called attention to the use of sealing-wax, and shortly after doing so gave a very valuable method whereby moulds can be easily made with a piece of apparatus which many of us have discarded—I mean a rolling-press. A piece of soft type metal was placed in a shallow steel box so as to allow of the type metal projecting slightly above the edge. Upon this was placed the relief, and a steel plate again upon the whole, and run through the ordinary rolling-press. A moment's reflection will show that no distortion can take place if care be taken not to have too much metal projecting.

Again: Mr. Woodbury names a means, included in a recent patent, where tinfoil is pressed into the hollows of a relief, and this is again backed with a suitable material. I have never seen any productions of this kind, but think they must be similar to those patented by Mr. Dallas in 1866, as he says:—"I also mould with tin, lead, or other metal foil by beating it with a brush," and then some adhesive material is pressed well upon it. He further says:—"Sunk surfaces prepared according to my invention may be employed to produce prints with half-tints." After describing the method, he says:—"This method of printing is now known as photo-relievo printing." Perhaps you have had enough of the "relief," and to relieve you I will treat of the last point, viz., the printing, which I can put into a very few words.

The principle involved in this operation is, that varying thicknesses of a semi-transparent material give corresponding variety in the depth of tone; so that if a mould be filled with a semi-transparent ink, all but the portions which occupy the hollows pressed out, and a material be furnished to which the ink will adhere, the result would be a print in perfect half-tone. This is what is done in the process now under discussion, and some results of which you now see. My object is accomplished if I have turned attention to the most valuable process not in general use—a process destined to mark a new era in our art.

Correspondence.

WASHING PRINTS.

DEAR SIR,—Will you allow me a space in your NEWS as regards the final washing of photographic prints? I will give a plan I have used for the last year, which, although a very old one, is a first-rate plan. After the prints are removed from the hypo, I place them in a pail of water with some chloride of sodium (common salt) for five minutes, and then I place them on a glass slab large enough to hold eighteen cabinets, and dab them; then take them up, swirl the slab, dab the back, and then dry them. This is an excellent plan, although old. I have three glass slabs, so I and my assistants can wash fifty-four in a very short time.—I am, dear sir, yours truly, C. R. R. VERNON.
Grafton Underwood, Kettering.

PHOTOGRAPHY IN DEVONSHIRE.

SIR,—A good suggestion was made in the YEAR-BOOK as to the publication of a photographers' guide-book to interesting scenery. I trust some one will adopt the suggestion, and supply a real want. In the meantime, would you or any of your readers give me any kind of photographic information about the north of Devonshire? I should feel greatly obliged for information as to a good central place for a few weeks' stay, within easy reach of good subjects, together with any notes or hints, the result of personal experience.

Such information would probably be interesting to others of your readers. I would gladly, in return, give Continental notes to any requiring such.—Faithfully yours, W. A. C. A.

Proceedings of Societies.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of the above Society was held at the Victoria Hotel, Bradford, on Monday, the 5th instant, the President, Mr. J. W. GOUX, occupying the chair.

The minutes of the previous meeting were read and confirmed.

The CHAIRMAN proposed "That a sale and exchange list, for members' use only, be issued with each monthly notice of meeting, and that each notice of any article for sale or exchange be subject to a charge of threepence for the first eighteen words, and threepence for each extra nine words."

Mr. A. W. BEE seconded the motion.

Mr. MORI most heartily supported the resolution, remarking that it would be much more satisfactory to know the person with whom you were having the transaction, besides there being a possible opportunity of seeing the article offered. He had on more than one occasion exchanged through the medium of an advertising journal, and been victimised. There was no means of redress.

Other members expressed their approbation, and on the motion being put to the meeting, it was unanimously carried.

The following gentlemen were then elected members:—Messrs. Braithwaite (Leeds), Gunson (Bradford), and Appleyard (Brighouse).

Mr. HOWARTH then exhibited to the Society, by request, a model of his stove for heating studios, which was inspected with much interest by the members, he (Mr. Howarth) taking it to pieces and explaining the principles of its construction.

Mr. W. E. BATHO laid on the table the three carbon prints referred to in his communication on the continuing action of light in carbon printing (see *British Journal*, March 26), which were handed round, the general opinion being that there was no material difference in the three prints. After some desultory conversation thereupon, he (Mr. Batho) read a paper on "The Woodbury Process" (see page 214). A number of reliefs and copies from paintings by the eminent firm of M.M. Goupil and Co. were handed round for the members' inspection, the prints being pronounced by several to be equal to silver prints.

In reply to a question by a Member,

Mr. BATHO stated that the pressure required for the production of the relief was very considerable, being estimated by some at about four tons to the square inch, but he believed the prints handed round were produced with a pressure of about one hundred tons, which was considerably under the other estimate.

On a Member inquiring if lead would answer for making the relief, Mr. BATHO said that it would not bear printing to any extent. A mixture of lead and type metal was employed as more serviceable. The CHAIRMAN inquired if lead and bismuth were not employed. Mr. BATHO suggested that the Chairman was probably thinking of fusible alloy. He (Mr. Batho) had tried it, but found it would not answer. A metal fusible at a low temperature was not necessarily soft.

Mr. SMITH was of opinion that the mechanical photographic processes were worthy of the more general attention of professional photographers, and should receive more consideration than they did. It was not so much a matter of £ s. d. as the advancement of the art, and photographers should devote more time and attention to them.

Mr. WORMALD said it was a matter of £ s. d. to most photographers. The process, to be effectually carried out, would require a very considerable outlay for mechanical appliances, hydraulic presses, &c. If any one could be found who would undertake the making of the reliefs it would be a different matter.

In reply to several remarks,

Mr. BATHO said the Woodbury process was not more difficult than any other of the methods of reproduction; but of course it required some amount of practice.

The CHAIRMAN remarked that one great difficulty with many photographers was that they received information regarding these processes by instalments, and thus did not get to know them sufficiently well. If the method were published in a concise and practical form, no doubt more attention would be given to it.

A hearty vote of thanks was accorded to Mr. Batho for his very interesting paper.

Mr. BATHO, in replying, made several remarks regarding the present method of doing business. He was of opinion that photographers ought to discard the traditional dozen cartes, and

endeavour to get larger orders, and then mechanical printing processes would be found economical.

Mr. BARLOW said that there would be some difficulty in persuading the public to change its method of doing business; it had been tried by more than one photographer of reputation. He believed Mr. Sarony had tried the experiment. He had commenced doing carte portraits at thirty for £1, but he had returned to the dozen.

Mr. WAXE had also tried departing from the generally-accepted method by charging for the negatives, irrespective of what number of pictures might afterwards be ordered. For the first negative he charged 8s. 6d., for the second 2s. 6d., and for further negatives 1s. 6d. each; but he had not found it pay. The matter lay more with the public than with the photographer, and so long as the public chose to abide by the present method of doing business, the photographer had no choice but to acquiesce.

Mr. BARLOW enquired if any member had tried the addition of methylic alcohol to the developer, instead of the ordinary methylated spirits of wine. He (Mr. Barlow) had been using it according to a formula given in the PHOTOGRAPHIC NEWS for February 12, and had found considerable advantage in its use during the late dull weather. He was of opinion that there was a gain of almost one-half in shortness of exposure.

Mr. APPEYARD said he had also tried it, and had found a similar advantage, though he scarcely thought to the same extent as Mr. Barlow had experienced.

After a little further conversation the meeting was adjourned.

Talk in the Studio.

THE ROYAL ACADEMY.—It is understood to be extremely probable that the Royal Academicians will, at an early meeting of the Council, take steps in furtherance of the long-since proposed reform in the constitution of the body, by adding at least ten Associates to the number established about three generations ago. Undoubtedly this will be a reform in the right direction, and it will certainly be very popular among artists, a considerable number of whom will expect to be elected forthwith. Of course it is understood that the proposed ten new A. R. A.'s will belong to a distinct class, and will not share equally with their fellows in the pension fund of the Academy. We suppose this fund, although a considerable one, would not support so great a new demand as the reverse of this supposition would imply.—*Athenaeum*.

"TO PERSONS ABOUT TO MARRY."—The new humorous and satirical journal issued at Tunbridge Wells, the *Maggie*, in a capital article on brides and bridecakes, has a practical suggestion which our readers will doubtless endorse. It suggests sending out to friends, in place of bridecakes, photographs of the bridal pair! But the *Maggie* shall speak for itself:—"How much more sensible it would be it, in lieu of this abominable bridecake, our friends, the newly-married, would send us handsomely-mounted photographs of themselves! A bride usually looks charming on her wedding-day, or a day or two before, and the bridegroom may be stimulated into some show of manliness on such occasions; he generally has his new clothes in which to display himself; so a man of many gifts would soon have a gallery of wedded friends round him, and by a judicious exercise of observation and philosophy would gain much outside experience which he could mark on the backs of his photos. Fancy this bachelor cynic, after witnessing the early tiffs of Mr. and Mrs. Joan Darby, and the little black looks scudding over their married horizon, returning to his den and ghoulishly chuckling at the pleasant artless simpering of this same couple fresh from the embellishing photographers! What a splendid study of life, and change, and character, the backs of these pleasant pictures would show, if our cynical friend carefully noted his observations as the varying circumstances of married life were exposed to him! Photographs in preference to bridecake, I humbly solicit."

To Correspondents.

VENATOR.—The flux mentioned will answer your purpose well. The article is altogether a good and practical one, and you may safely follow its guidance. 2. We shall have pleasure in receiving the details of your method of making a bellows for a camera.

—Of course the first who published deserves the thanks of the unity, rather than those who retain for their own private improvements which they work out.

GALA.—The yellow spots are without a doubt due to the bronze powder used in the "gold" printing on the cards. 2. The "lubricator" used with the burnishing machine would not have any injurious effect on the print; but it is possible that the burnishing process would aid in distributing the injurious particles of bronze over the surface of the prints.

A READER (ALAN C.)—It is scarcely probable that you could obtain any very good results by detaching a print from its mount, and printing from it in the pressure-frame, to produce your negative. It is probable that both surface and texture would be irregular, and produce granular results. It is not probable, either, that you would get sufficient printing force in such images. You will do wisely to practise the recognized beaten track of photography until you have mastered the technical details and acquired manipulating skill; then you may without impropriety experiment and try novel plans. It is not necessary or desirable to tone a paper negative at all, as the brown tint produced by simple fixing in the hypo bath is best for negative purposes. Paper prints cannot be fixed with cyanide.

CADMIUM.—If the surface of the Daguerreotype have been scratched by the rubbing to which you refer, there are no means of restoring its pristine beauty. Washing with a weak solution of cyanide of potassium will remove the tarnished effect which sometimes follows exposure on a Daguerreotype; but, if possible, you should entrust the work to a photographer who is familiar with the treatment of Daguerreotypes.

LEO.—The spot on the negative to which you refer is what is commonly known as a comet, and is probably due to the colloidion, in which some insoluble or undissolved particle has been floating. Colloidion simply iodized with iodide of potassium is very liable to this trouble, small particles of the salt, or impurities in the salt, remaining in suspension in the colloidion, and causing insensitive spots with tails; the tail generally running in the direction that the colloidion flowed on the plate.

PRYO (1).—We have published many formulae for retouching varnishes, and instructions for the mode of using them. We cannot with propriety occupy sufficient space in this column to repeat such instructions. A very good varnish of the kind may be made by dissolving thirty grains of gum dammar in an ounce of spirits of turpentine. In recent YEAR-BOOKS you will find many formulae of the kind.

ONE IN THE TRADE.—Mr. York added five grains of nitrate of baryta to each ounce, and found that answer. It has, we believe, a tendency to gradually increase intensity. It does not, so far as general experience teaches, injure sensitiveness. Acetate of iron gives intensity, but does not permit of decreased exposure. It is only desirable to use it when there is difficulty of getting sufficient intensity. If you wish to use it, you must prepare it yourself. The addition of a drop or two of liquid ammonia to the ordinary iron developer containing acetic acid will form a portion of acetate of iron in the solution, as will also the addition of acetate of soda. Or it may be made by adding a solution of acetate of lead to a solution of sulphate of iron, filtering out the sulphate of lead, and leaving acetate of iron in solution. The addition of sugar to the developer is, in our opinion, an improvement; and if added in any large proportion, the proportion of the acetic acid may be reduced.

YOUNG BEGINNER.—It is difficult to answer your question as to the smallest possible studio in which a good card portrait can be produced, as so much depends on the standard of excellence you set up. If your means and space impose limits, you may do good work in a house 15 by 10 feet, using a good quarter-plate lens. No. 2 of the lenses you name will answer best for views and groups.

F. M. STURGEON.—We have on more than one occasion met with cases in which photographs mounted with india-rubber solution in an album have become discoloured. The india-rubber itself undergoes decomposition, and acquires the character of a brown resin. The prints you enclose have precisely the character of those to which you refer. The yellowness, or brown tint, is not the ordinary type of photographic fading, but a brown stain resulting from the change in the india-rubber, which had partly permeated the substance of the print. One of the best mounting materials we know for placing photographs in scrap books, is the alcoholic solution of gelatine which we described some time ago, and which is sold under various names, such as "Parlour Paste," "Marion's Mounting Solution," &c.

ASHES.—The experience you relate is annoying and perplexing; but it is difficult to suggest a remedy, unless you are prepared to recover the silver from your residues yourself. We shall have something more to say on the subject in our next.

B. SLADE.—We have forwarded the address.

PERPLEXED.—It will be impossible to do really fine work regularly in such a studio as you describe. The lighting of the specimens enclosed is certainly very unsatisfactory, and they are all very much out of focus. The best plan you can adopt will be to have a very complete system of blind, to cover at will the east side and half the top on the same side, and the west side and half the top on the same side, using one side in the morning, and the other in the afternoon. Tissue-paper or tracing-cloth answers best for keeping out direct sunlight.

Several Correspondents in our next.

The Photographic News, May 7, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO PHOTOGRAPHY AND WOOD ENGRAVING—THE NEW FOREIGN FELLOWS OF THE ROYAL SOCIETY—ABSOLUTE ALCOHOL.

Photography and Wood Engraving.—Nothing seems easier to a photographer than to produce an image upon a wood block for engraving, and yet, practically, there are few more difficult operations he can have to do with. The print is required sharply lined upon the box-wood block, so that the engraver may see every detail of the picture, this being especially necessary if the image is not a reproduction of a drawing, but an object from nature. In the latter case, as there are no lines shown, but only dark and light tones, a very good cutter indeed is necessary, who must himself be a bit of an artist in order to reproduce by lines, sufficiently thick and close together, the dark tones of a photograph under his hands. One very serious difficulty occurs at the outset, and that is the immersion of the block in water or a liquid of some kind. In order that the block should not suffer by such treatment, one of very good quality must be selected, consisting of three or four centres, well fixed together. If the block is to be coated with a thin film of albumen, or some such material, first of all, it is of course necessary that the surface should be wetted; and the same holds good if a carbon image is to be developed on or transferred to it; it is only when a greasy image can be applied to the wood surface by some colloid printing process that there would be no absolute need for moistening the surface. Unfortunately, the wood engraver dislikes any trace of grease upon his block before it is cut, and if any assistance from a draughtsman's pencil is necessary, no touching can obviously be done upon a greasy surface. There is also an objection to the albumenizing of the block, for if there happens to be any perceptible film upon the wood, the cutter cannot produce a clean picture. One is therefore beset with difficulties as soon as work practically begins. Recently we have been experimenting once more in the matter, and this time we have laid aside the albumen printing method, and employed the carbon process. The former involves steeping the wood in liquids two or three times, and if the surface has warped in the slightest degree after sensitizing, then it becomes impossible to secure perfect contact between the cliché and the wood block, any undue pressure simply resulting in the fracture of the glass plate. It was impossible, we found, to apply a film of collodion or rubber dissolved in benzol to the wood surface first of all, in order to protect this from the action of warm water when it came to the development of the carbon print, for although, when dry, a good enough film was produced over the wood, it invariably gave way as soon as it came into contact with hot water. It was desirable, too, that the wood-block should be whitened a bit in the first place, and when either of these liquids was applied after a little powdered chalk had been rubbed on, the adhesion was less perfect than before. Next, gelatine was employed with the chalk, and alum added to make it insoluble, but the result was a film of too decided a character, although a very fair image was secured in this way. A better result we were afterwards enabled to get by using a paste made up of fine chalk and sizing preparation, that sold by Newman, of Soho Square, being the particular material we employed. This white paste was rubbed well into the wood, and, when perfectly dry, brushed off with a stiff brush. In this way the pores of the wood became filled with particles of chalk which were cemented in by the sizing, the latter, moreover, protecting the wood when put into warm water. A bit of carbon tissue that had been impressed under a cliché was swollen in cold water, and then pressed against the wood-block thus treated, and after a few minutes the image was developed in warm water as usual. The result was a perfect image upon the whitened block, which seemed to have been rendered impervious to water by the sizing and chalk applied to the sur-

face. There was, moreover, no film to interfere with the cutting, and retouching subsequently with the artist's pencil over one or two flaws was a matter of no difficulty. In our case, it was a foreign woodcut that had to be reproduced, and therefore the cutter experienced no difficulty in cutting, any more than in the case of the original, except that the reproduction being a little smaller, the lines of the picture were somewhat finer. On development the pigment lines appeared thicker than they should be, but on drying they diminished in a great degree.

The New Foreign Fellows of the Royal Society.—If the Royal Society have not this year elected any Fellows connected with photography from among scientific men at home, it has honoured several foreign gentlemen of distinction, whose names are household words among us. There is, first of all, that veteran in photographic science, M. Fizeau, of the French Academy, whose name has been associated with our art ever since the days of Daguerre. Every novelty in photography, or memoir concerning it, that is presented to the Academy of Sciences, is almost, as a matter of course, first of all referred to M. Fizeau for his opinion, for no one knows better than him what is new and important in photography. Then comes M. Janssen, who, it will be remembered, discovered, simultaneously with Mr. Norman Lockyer, the fact that the protuberances of the sun can be seen during sunshine as well as during an eclipse, and who, for the past ten years, has headed every French expedition sent out to make spectroscopic and photographic observations of an astronomical character. During the siege of Paris he escaped from that capital with all his scientific apparatus in a balloon, proceeding to the Mediterranean to undertake an observation of some importance. Another new Fellow of the Royal Society is the German chemist, M. Kirchhoff, whose spectrum work is world-renowned, and who was one of the first, in conjunction with Bunsen, to draw up a concise spectrum table. Another German chemist of note, Kekulé, is also included in the list.

Absolute Alcohol.—A method of preparing absolute alcohol has been recently suggested by Mr. J. L. Smith, in the *Chemical News*. Photographers are aware that commercial absolute alcohol rarely contains more than 98 to 99 per cent.; and a liquid of this kind is easily produced by shaking up a litre of 94 per cent. alcohol with 120 grammes of freshly ignited lime, at intervals, during the period of a week. The lime is allowed to subside, and the alcohol will then be found to mark about 98 per cent. If really absolute alcohol is required, a further treatment with lime is necessary, another similar quantity of the freshly prepared material being added and shaken up as before. When the lime has subsided a second time, the liquid will be found to be absolute. The method may be a little tedious, but if absolute alcohol is required, it is as simple a plan of securing it as can well be devised.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER III.—THE NEGATIVE BATH.

THE silver baths, both "negative" (that in which the collodionized plate is sensitized) and "positive" (or bath for sensitizing the paper for printing), are often found to be very troublesome; but generally to those only who, too indolent or stupid to endeavour to obtain a proper acquaintance with its properties, are ignorant of its constitution and chemical action; to these—and let us hope there are few such among our readers—the negative bath is a constant nightmare, and brings them to the confines of distraction. When it is "out of order," as it usually is, if it can ever be said to be in order, its disorders are extremely varied in character, and vexatious to the operator, who is at a loss as to the cause. One operator finds his bath is addicted to that unpleasant habit of "fogging," and of this alone there are several species—an universal veiling of the plates in lights as well as shadows, though

of course it is not so perceptible in the former as in the latter; and in some cases entirely obliterating the image on the plate, or only a partial eclipse in the shadows. The bath of another worker may produce negatives too thin or weak, or with not sufficient contrast. A troublesome deposit, causing minute holes in the negatives, called "pinholes," is also another sign that the bath is out of sorts; while how many operators have been driven to the verge of insanity by dreadful streaks and stains, the which they knew not how to get rid of! None can be entirely free from these visitations at times, but the operator of intelligence can generally determine the cause, when it is easy in most cases to remedy the defect.

One of the most fruitful causes of trouble in the negative bath is, as I have taken occasion to state before, in having too small a bath-holder, by which severe loss is suffered in many ways. In the first place, it can only be worked a short time before it gives signs of becoming disordered. Secondly, as it is out of order, it must be renovated, and this entails time wasted, trouble and loss of silver in pouring from vessel to vessel, in boiling and filtering, and therefore this loss has to be made up by the addition of new silver, and this is sure to disturb the harmonious working of the bath, and entails on the operator the horrors of continual uncertainty. The fourth, and by no means the least, objection to a small bath, is the fact, that it is likely to get out of order at any moment, and at just the moment when you want it most. It may be said, with great force, that the same may be expected of any negative bath, however large; but with a bath of good size (say three gallons) you can calculate with some degree of certainty by the amount of work done. It may be further urged that a new bath should be ready to take the place of the disordered one, and is equally necessary with a large as with a small bath. Very true, but as a new bath is never as good as one a little in use, the less often you have these untied servants the better. A silver bath continues to improve up to the very moment of its decay. A small bath is soon overcharged with iodide, the source of "pinholes" galore.

Need more be said? Are time and temper, worry and anxiety, nothing? If economy were in question it would be another matter, of course, because for a few shillings and pence we are content often to give up peace of mind, heaped up measure; but in this case even economy is on the side of the large bath. The larger the bath, the less change is there really in its constitution, and consequently the more certainty of working is assured.

TO MAKE THE NEGATIVE BATH.

Dissolve, in the bulk of water you require, nitrate of silver, until the hydrometer when placed in it marks thirty grains. One-half of this solution should then be poured into another vessel, and iodized by adding to it ten or twelve grains (according to the quantity of solution) of iodide of potassium or ammonium, when it will be found to turn to a milky colour, and a slight precipitate may be observed. Filter the uniodized solution, and into this clear solution filter the iodized portion. Observe this order of procedure, because by reversing it and filtering the uniodized portion last, it takes up from the filtering paper the surplus iodide left behind from the iodized solution, and the consequence is an approach more or less closely to a fully iodized bath, a thing you do not, of course, desire. This bath should be quite clear.

If you do not require to use this bath at once, it should be placed in a clear "white" glass bottle, and placed in the light and sun. It should first be ascertained whether the solution is acid or alkaline: if acid, blue litmus paper will turn more or less red according to the amount of acid in solution, and liquor ammonia should be added to the solution carefully (shaking the bath to mix it thoroughly after each drop of ammonia added) until the silver solution, on being tested with litmus paper, shows no trace of acid; that is,

when blue litmus paper does not change colour, and red paper changes to the colour of the blue paper. It is safer, in using liquor ammonia for this purpose, to put a few drops in an ounce of water, by which means you have more command over it; also, in the operations of adding ammonia or acid to a bath, it should be thoroughly mixed up before testing or adding more, or you are likely to overdo it.

The bath, slightly alkaline then, is placed in direct sunlight, and after a short time it will grow black and inky, organic matter being in solution, and afterwards deposit this organic matter as thick mud at the bottom of the bottle, while the solution will become clear as crystal. This should then be filtered quite clear, and can be acidified with nitric or acetic acid. In the choice of acids there is some difference of opinion, some operators inclining to a preference for nitric acid, others never using anything but acetic acid for this purpose. I cannot say that I ever detected any difference in the baths made up with these two acids, but I have generally used nitric. It can be said in favour of this, that if a new bath shows signs of acidity in its first state as silver and water, it will most probably be from the acidity of the silver salt, thus denoting the presence of nitric acid, and it seems reasonable that that acid should be the one we choose; and, too, the same acid is liberated in the bath from plates coated with red collodion, containing free iodine.

A perfectly neutral bath can scarcely be said to exist, chemically speaking; but if it is what is generally called neutral or slightly alkaline, the application of the developer to the plate sensitized therein will fail to bring out any image, or it may make its appearance for a few moments, and will be immediately covered universally with the deposit known as "fog."

The effect of acid in the bath is to decompose any organic matter present in the solution, as well as to neutralize any oxide. Should too much acid be poured into the bath, place in it a piece of blue litmus paper, which will of course turn red; now drop in cautiously, in the manner described in making the bath, a few drops of liquor ammonia; this throws down a blackish precipitate—oxide of silver. Be careful to stir the solution on each addition of ammonia, that too much be not poured in; the gradual change of the litmus paper back to its normal colour being your guide.

Care should of course be taken to guard against the entrance of foreign substances into the bath solution, as many are fatally antagonist to its photographic action. Of those in use in the dark room: iron (the developing agent) and hyposulphate of soda, or cyanide of potassium, are especially to be guarded against.

HYALOGRAPHY AND ITS APPLICATION TO PHOTOGRAPHY.

BY JOSEPH LEINFOLD, OF LISBON.

THE art of etching glass is no longer new, for among others Professor Böttcher and Dr. Brauneis have given much attention to the subject many years ago, and as these gentlemen found that the characters etched on glass could be multiplied by printing, they gave to this branch of industry the technical name of Hyalography. But very few disciples followed these two experimenters in their labours, as, indeed, is not to be wondered at, seeing that the graphic arts at that time were not in such a forward state as they are at the present day, when they are used in every connection.

Böttcher and Brauneis were quite aware of the perfect uniformity presented by a mass of glass, and the great advantages it therefore possessed in this respect over copper and steel for etching purposes. They prepared a sketch upon a polished glass plate which had previously

been covered with the same preparation as that used for copper, and having bordered it with wax, poured upon it the etching liquid, which was allowed to act until the lines were sufficiently deep for printing. The etching liquid in this case was made by placing in a covered vessel of platinum or lead some powdered fluorspar, and pouring upon this the necessary quantity of sulphuric acid, diluted with twice its volume of water. After mixing well, the clear fluoric acid at the top is separated, and this can be at once employed for etching. The drawing may be etched either with concentrated acid or acid vapour, both plans having special advantages. In the latter case the vessel in which the sulphuric acid and fluorspar is contained is warmed moderately, and the glass plate, with the sketch upon it, is placed above to become etched by the vapours given off. The printing blocks produced in this way are matt and rough, while those secured by means of acid appear polished.

In the State Printing Office at Vienna, as also in Domdorf's establishment at Frankfort, impressions on glass have been produced in this way for the last twenty-five years. Very great difficulties have been found, however, in printing from such plates, as the glass is always in danger of springing in the printing press. Of course it is possible to reproduce the engraving by means of electrotype, but in this case the peculiar characteristics of glass engraving disappeared, and this is one reason, no doubt, why the art of hyalography is but little cultivated. By applying photography to the art, however, we think that a new impetus will be given to this important industry.

It is known that in France—and, perhaps, elsewhere—glass plates for ornamental purposes have been produced by means of photography and the etching process. If such productions as these are not altogether suitable for printing (they are not, of course, intended for such purpose), it is quite clear that the photographic negative plate, if submitted to a proper etching process, presents no difficulty for use as a printing block. Six large plates are now in our hands from a French establishment, which are destined for window ornamentation, and upon which, it appears, landscapes have been printed by means of photography, and subsequently etched in. The half-tones of the photographic pictures are wanting in these plates, and they seem never to have been etched in at all. The action of the acid has made a grain which renders the lights and shadows most perfectly.

In etching a photographic cliché taken from a picture which has been produced by lines and dots, the operation is a much easier one. When the plate has been properly intensified and fixed with quicksilver and chloride of platinum, it withstands perfectly the subsequent etching with dilute fluoric acid. M. Scamoni has given valuable directions in his handbook of heliography (St. Petersburg, 1872) for preparing photographic plates for etching.

M. Aubel, of Cologne, who has adopted a similar process of etching photographic reproductions of line-drawings, has shown us some fine results, which were produced with much certainty. We believe, indeed, that to M. Aubel belongs the honour of having been the first in Germany to apply photography to the art of hyalography.

Pictures etched on glass in this way have a very delicate, but, at the same time, neither a soft nor warm appearance; they are, in fact, as cold and transparent as the material in which they are produced. If transferred to the lithographic stone the impressions lose their cold, glassy appearance, but then, again, a large proportion of the purity and delicacy of the glass engraving is lost.

THE PRACTICAL PRINTER IN AMERICA.

XXIII.

FIXING BATES AND FIXING PRINTS.

As has before been written in one of the preceding chapters, the prints need a fixing agent to remove all traces of the

silver in them. This fixing agent used is hyposulphite of soda, and a bath of it is made of a certain strength by dissolving this in a quantity of water, and the prints are immersed therein for a number of minutes. Cyanide of potassium is never used in fixing the prints, although it is sometimes used in fixing the negatives. The reason of this is because it spoils the beauty of the tones, bleaching the prints fearfully, and on the whole is a miserable fixing agent to use for delicate photographs.

There is a diversity of opinion among photographers about the strength of the fixing bath, some using it much stronger than others do. I myself am inclined towards having a weak bath, and fixing a longer time than what I would with a strong bath, as the action will be more gentle, and on the whole better results are obtained by doing so, and blistering and bleaching are, in a great measure, cured. It is very important that the hypo bath should be made up every time you require its use, as old hypo baths are very injurious to the prints. Take a two-gallon bottle, and place in it about one pound of the hypo crystals, fill up with water, shake well, and label this bottle "Sat. Sol. Hyposulphite of Soda," and when you have made it saturated, you are then ready to make the bath as per formula given below. To be sure that this hypo solution becomes saturated, make it up at least two days before you wish to use it. Just before using, shake the contents in the bottle for about two minutes.

When you wish to make the bath, take of—

Sat. sol. hyposulphite of soda	...	1 ounce
Water	...	8 ounces
Sat. sol. bicarbonate of soda	...	$\frac{1}{4}$ ounce.

Large quantities in proportion. Make it up in a dish which is kept expressly for this, and this alone. The bicarbonate of soda is used in the fixing bath for the purpose of making alkaline any free acid there may exist in the solution. This is very important, for in case the solution should happen to be acid, it would finally be the means of liberating sulphur and forming sulphide of silver, and it would deposit itself on the prints, affecting them seriously in look, tone, and permanence. Aqua ammonia is sometimes used for the same purpose, but if it is to be used, only a few drops of it are necessary, as any more will cause the albumen on the prints to become very tender, giving a look of transparency to the whole print. The prints are very easily torn when the ammonia is used to excess, on account of the softness of the paper. On the whole, I think it better to use bicarbonate of soda, as it is, as before said, a much milder alkali than ammonia. During the cold months of winter, and also at all times when the water is cold, the soda solution should be heated to about a lukewarm state (no more), as the action of freeing hyposulphite of soda solution will be very slow, and also injurious to the prints, causing innumerable blisters all over the prints.

An assistant should pass the prints from the washing-tank, a number at a time (so as to get them in as near as possible at the same time), and place them in the hypo bath (without touching the hypo solution with the fingers while passing the hands from one to the other), and the operator at the hypo bath should separate and cover them with the solution as soon as he can, for if this is not done, and the prints are fixed imperfectly, they will then have mottled yellowish-brown spots all over them where they have been laid together, and which are very observable when washed and dried. More about imperfect fixing, &c., at some future time.

After you have had all the prints placed in the bath, then note the time by the clock. Keep the prints in constant motion while in this bath, and do not allow one single print to stick to another, even for the space of ten seconds, if you wish to have them properly fixed. Too much attention cannot be given to this little thing if you wish to have your prints fixed evenly, and not have them come out, when finished, full of darkish-brown spots, yellow stains, &c.

The reason why I have advised you to have an assistant place the prints in the bath for you is, because if you are inexperienced in doing it yourself, you will be apt to get some of the hypo on the prints before they are wholly placed in the bath and under the solution, and when you do that they will be spoiled, and all of the subsequent fixing will not remove it. They will be stained, and among other things there will be the so-called "finger-stains," caused by the fingers having had hypo on them when the prints were taken up, just after toning, and before fixing.

After the prints have been in constant motion for full eight minutes, look through them by holding them, one at a time, between you and the light, and after you have looked at a dozen or so, and the shadows, hair, &c., present a clear transparent appearance (and not at all mottled) to the critical eye, the prints are fixed. If they are not clear, let them remain in the bath until they are. An experienced "fixer" can tell in a few moments whether they are fixed or not by doing as has just been said.

If the prints are fixed, then pour off about one-half of the solution in the dish, and fill up with an equal quantity of water. Move the prints continually in this water for about five minutes longer, then pour off about three-quarters of this, and fill up again. The reason of this is to get the density of the liquid down gradually to that of water, so that the prints will not blister, which they would surely do if they were placed directly from the hypo into the water ready for washing. Alcohol placed in the hypo bath answers the same purpose.

Some printers (myself among them) place their prints, after they are removed from the hypo, in a bath of salt-water, made by placing a handful of table-salt to every gallon of water. Let them remain in this from five to ten minutes, and then set them to washing. The object of this salt is not only to displace the hypo from the prints so that they will wash better, but also to prevent them from blistering in the subsequent operations, and when already blistered to cure it.

THE BEER AND ALBUMEN PROCESS.

BY T. CLARKE.*

Your Secretary suggested yesterday that I should prepare and read a paper on the result of my experience with the beer and albumen process, particularly with reference to those points which require the greatest care when testing this process for the first time, and for the want of which knowledge I failed continually during my earlier trials.

This process was first introduced by Mr. W. H. Davies, of Edinburgh, and is much used by the members of the Edinburgh Photographic Society. Subsequently, however, Captain Abney published a somewhat different formula in the early part of last year, and having tried both formulae I may state that my most successful results have been obtained with that of Captain Abney, to which in future I intend to adhere, and my remarks will accordingly be directed principally to that modification of the process.

The glass plate requires a substratum, the cleanest and most efficient being a solution of gelatine, which is made thus:—

Gelatine	75 grains
Distilled water	60 ounces
Ammonia	$\frac{1}{4}$ ounce
Alcohol	1 "

It is better to place the gelatine in twenty ounces of cold water, and, when softened, to add forty ounces of hot water.

I have tried albumen as a substratum, but prefer gelatine, as it is freer from specks, and enables the collodion film to adhere to the glass so tenaciously that a strong stream of water will not injure the film; neither does it injure the bath, as is the case with albumen. I apply the solution with a Blanchard brush.

An old or porous collodion is a necessity. I am quite sure that I can attribute many of my early failures to the want of a suitable collodion. The sample with which I succeeded best was supplied to me by Messrs. Rouch and Co., of London, and the negatives now before you were taken with this collodion. Messrs. Rouch and Co. call it "D," or special bromo-iodised collodion. It had been in my possession, iodised, for ten months, and when poured upon a plate had a very slight tendency to solidify like jelly. To this collodion—in quantity eight ounces—I added two ounces of newly-iodised collodion, and then to the whole ten ounces I added two grains per ounce of powdery pyroxyline and one grain per ounce of cadmium bromide. I found the collodion to be exactly what I wanted—namely, of a creamy consistency when poured upon the glass plate, and after immersion in the nitrate bath, giving an even, white film like opal glass.

As regards the nitrate bath, it should be forty grains to the ounce; and here let me state that the larger the bath the better, more even, and reliable will be the sensitive plates. Any bath of the requisite strength which gives a clear wet-plate negative will do for this process. The time of immersion is about four minutes.

From the silver bath the plate is transferred to a bath of distilled water, and is then rinsed under the tap for half-a-minute, after which it is ready for the preservative, which is made thus:—Procure three bottles, which label Nos. 1, 2, and 3. In No. 1 bottle place the whites of four eggs, or a relative quantity of Thomas's dried albumen, which answers admirably, to which add four drachms of liquid ammonia; in No. 2 bottle five ounces of plain beer; in No. 3 bottle five ounces of beer and ten grains of pyrogalllic acid.

Take a quarter-ounce of No. 1 and the same quantity of No. 2, which mix together, and then pour over the plate, on which allow it to remain half-a-minute. Then wash the plate under the tap for a quarter of a minute, after which apply half-an-ounce of solution No. 3, which allow to drain without washing the plate, and the latter will then be ready for the drying-box.

I now come to the development, which is the most important point of the process, and with which, I believe, many persons have failed, as I did myself when first trying this process. I was under the impression that considerable density could be obtained with the alkaline developer. This, however, is not so. Unlike an emulsion plate, there are two stages of development, in the first of which, with the alkaline developer, only a very weak image is obtained when looked at by reflected light. Do not push this stage farther, but wash the plate under the tap. So far the bromide only in the film has been reduced, the iodide remaining unaltered. The iodide, however, is acted upon in the next stage of development, and density thereby acquired, although it will probably be found requisite to intensify with acid silver after fixing. Captain Abney explains the chemical action of the developer thus:—"The alkaline development produces a faint image by the reduction of the organic salt and bromide of silver to the suboxide of silver. The iodide is unattacked by it. The acid silver development utilises the exposed iodide thus:—The attraction of the suboxide for fresh silver (deposited by the acid development) is increased by the irritated oxide, and thus density is acquired."

The following are the developing solutions:—

No. 1.—Pyrogalllic acid	12 grains.
Water	1 ounce.
No. 2.—Liquor ammonia	1 part.
Water	4 parts.
No. 3.—Citric acid	60 grains
Glacial acetic acid	30 minims
Water	1 ounce
No. 4.—Nitrate of silver	20 grains
Water	1 ounce

No bromide of potassium is required, as the trace of preservative left on the plate acts as a restrainer

* A communication to the Liverpool Amateur Photographic Association.

In developing, first rinse the plate under the tap, then flood with half-an-ounce of pyro. solution No. 1, after which add to the same solution two drops of ammonia solution No. 2. When detail is feebly out, wash the plate, and apply half-an-ounce of pyro solution No. 1, with six drops of acid solution No. 3. To the same solution afterwards add two or three drops of silver solution No. 4 until density is acquired. Wash and fix in a solution of hyposulphite of soda containing one ounce of soda to six ounces of water. It will probably be found necessary to intensify with pyro and acid silver after fixing, with which any amount of density can be obtained.

I may here state that before the last application of acid silver in intensifying I flood the plate with a solution of iodine and potassium, which prevents stains and keeps the shadow bright. It is composed thus:—

Iodine	...	...	...	20 grains
Iodide of potassium	...	...	...	40 "
Water	...	...	...	1 pint

So far as my experience goes, these plates do not require any backing, the film being sufficiently opaque to prevent reflection.

You are, no doubt, aware that the recent scientific expeditions undertaken for observing the transit of Venus were supplied with plates made by this process. The results have been, I understand, in every way satisfactory.

I may also state that these plates are rapid. The negatives on the table were taken with an exposure of one minute in a comparatively dull light in the afternoon, the lens being Dallmeyer's whole-plate doublet with a half-inch stop.

I must say, in conclusion, that I can confirm all that Captain Abney has said in favour of the process, and I certainly prefer it to any other I have tried, both for reliability, perfection of result, and the comparative ease with which the plates can be prepared.

PRACTICAL SUGGESTIONS ON RETOUCHING.

SOME capital hints of a practical kind on retouching various kinds of negatives appear in our Chicago contemporary, the *Western Photographic News*, from which we quote as follows:

The Negative of an Aged Face.—It is difficult to determine just how much modifying and removing of wrinkles is allowable in retouching negatives of this class; but certain it is that much more of it is done than is consistent with a correct likeness of the original. Let nature be our guide, and we shall find in a correctly printed photograph not a natural line of the face entirely removed, but the lesser ones so delicately traced as not to offend the eye by their prominence. It often occurs that the negative contains shadows so dark as to render considerable working upon all these lines admissible; but in doing this we must carefully preserve their proportionate value to each other. Also do we find that a shortening of these most prominent lines is advantageous, as it removes much that is overdrawn, and therefore unnatural. If, on the contrary, the negative under consideration possesses delicate shadows, instead of dark ones, it requires constant care that the subordinate lines be not entirely lost in the effort to produce a smooth surface. Particularly is this the case when the further side of the face is in shadow. Then the strongly-marked lines from eye to cheek, from nose to chin, are visible enough upon the light side, but quite indistinct within the shadow, and almost invariably are obliterated in the finishing process, giving to the eye and cheek upon that side a swollen and unnatural look. So often is this mistake made, even by retouchers of experience, that it cannot be too closely guarded against. The other extreme, that of making these lines too bright and sharp, would be equally wrong. But what shall we say of a class of subjects that are constitutionally unfitted to observe a mark of time upon their pictured faces, without wailing about it? They would set at variance all ideas of the fitness of things, all rules of cause and effect, and suffer the stigma of a lack

of common sense, rather than have their pictures show these signs of age. To the retoucher we say, if no compromise can be effected, choose between art or interest.

The Child Face.—These negatives generally require but little work, except to improve the expression of face, or remedy a faulty negative. It sometimes happens, however, that a negative is made which, from shortness of exposure or badly managed light, contains shadows so dark as to seem almost clear glass; and, not being possible to obtain a better one, it is left to the retoucher's skill to supply deficiencies with the pencil. The following method will be found, after sufficient practice, to be both comprehensive and expeditious.

After the negative is ground, the scrapings of lead pencil or crayon must be carefully laid upon the dark shadows with a crayon stump; then, after brushing away the residue, proceed with the retouching pencil to draw many of these fine lines, already spoken of, across the entire shadow, until sufficient opacity is obtained; then the smoothing up of the whole is comparatively an easy task, and a just proportion is maintained.

If the untouched negative contained no guide to enable the retoucher to judge of the reflected lights, they must be placed within each shadow by a correct knowledge of chiaroscuro. And just here let me say that the most successful retoucher will be the one that can most readily and thoroughly understand that no part of the pictured face is just like the surrounding parts in point of density, and a negative that is not full of these half-lights and half-shadows, after the retoucher's work is done, is a failure in an artistic sense. I have seen negatives, not of children altogether, made under a top-light, or with poor instruments, that needed more retouching to make the shadows light enough than anything else. If an operator makes such negatives as a rule, we must conclude that his knowledge of the art is very limited, or his materials for the work exceedingly poor. To the retoucher I would say, you have a sorry task to perform, and the usual directions contained in these papers will, I fear, not benefit you very much; as they describe the treatment of negatives likely to be made under more favourable circumstances.

Slightly Blurred Negatives, from whatever cause (either the moving of the subject or the focussing of the instrument), show no dividing line between the lights and shadows. As a consequence, to remedy this defect, the contrast must be made more distinct with the pencil. To do this, first draw a sharp line just where, had the negative been a perfect one, there would have been a distinct line of light next a dark shadow. Work upon the light side of this line until it becomes blended with surrounding parts, leaving the dark side as sharply defined as necessary to produce a proper effect. This method is particularly available in bringing out the features more perfectly. For instance, the sharper division of the nostrils, and a decided point of light upon the tip of the nose, are necessary. The upper eyelid must be sharp upon its lower edge and the upper edge of eyebrow; the difference between the white of the eye and iris made more distinct; also the light of the eye within the iris may need a decided touch. The edge of lips, and the lights about the shadows of mouth and cheek, must receive attention. The forehead and chin must be made to blend out sharply from their surroundings at their very highest points of light. Of course it would be manifestly improper to draw a sharp outline of the face, or any outline of the face, or any feature belonging to it, around the entire outline. These sharp divisions are only admissible upon the nearest points of sight. As the face or feature recedes, it should be correspondingly softened about the edge, and dimmed in point of light. The careful study of a perfect negative, lighted nearly the same as the one to be retouched, will be a sure and safe guide for the placing of these sharp divisions; and the attentive, earnest worker in this direction can rest assured that it is possible to double the value of a negative of this kind; if care and judgment be used in following the above method.

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WHAT TO DO WITH RESIDUES.

ONE of the perplexing questions which the photographer in a small way of business finds it difficult to answer is, What is the best mode of dealing with residues and waste solutions, so as to recover the value of the precious metals they contain? It would be clearly wrong to throw them away; it is troublesome to recover the metals when only small quantities of material are to be dealt with, especially in inexperienced hands; and the inexperienced photographer is entirely in the hands of the refiner if he save his residues to send them for sale or to be reduced. We believe, in most cases, he may trust the refiner safely, and that he will find this the wisest course; but not, as will be seen, always. We have published from time to time very simple methods of recovering the silver from various kinds of wastes, whereby from fifty to seventy per cent., or even a still greater proportion, of the original silver employed may be recovered without much trouble or expense. But even the simplest of these requires some experience and some appliances to carry out successfully, which to photographers conducting small businesses, with little assistance, present difficulties. Our frequent advice to such inexperienced photographers has been to throw down the silver, and send the precipitates to a refiner with every facility for reducing them, rather than risk wasting time and material in unsuccessful attempts themselves. But another difficulty from time to time occurs, of which an example has just been brought under our notice. From design, or accident, the refiners' estimate of the value of the precipitates forwarded appears to be singularly inadequate. In the case to which we refer, a correspondent divided a quantity of residues into two equal parts, and sent to two different refiners. The amount received in return from one was little more than one-third of the amount received from the other. A remonstrance brought another remittance, and a further remonstrance a still further remittance of cash, the total amount, however, still remaining far short of the amount forwarded in the first instance by the other refiner. Here is our correspondent's statement of the case:—

"DEAR SIR,—Will you tell me how to get the most money for my ashes, &c., if there is a convenient method of recovering the metal by myself? Because I am not satisfied with the results of what I have sent to the refiners. I use a sheet of zinc suspended in the tub, to precipitate the silver, &c., from the hypo solution. I then filter through felt and dry in the oven, and pound it to powder, and then burn it over the fire in an iron pot that I use to burn my cuttings, that it may be thoroughly dry. I have been allowed 6d. per ounce for forty-four ounces. The cuttings, filters, &c., I burned over the fire in a large iron

pot. I received 1s. 6d. per ounce for sixty-seven ounces. I trim all my prints before toning, &c., and use thirty-five-grain bath.

"The first lot of ashes I ever sent to the refiner's I divided into two parts, twenty-nine ounces each, and hypo residue thirteen ounces each part, and sent to two refiners, whom we will style A and B. A sent me £3 5s., and B £1 7s. I was careful to mix well the ash, that it should be the same quality, if possible, all through. I wrote to B and told him he had made a mistake, and sent me the money intended for another person, as I was sure my ash would yield more metal than he had allowed for. He answered he would make two more assays of my waste. He then writes to say that after two more careful trials, he finds he cannot allow me more than £1 13s. I wrote again, and told him I had sent a like quantity to another refiner, and the result. He answers that he has again made two more careful trials, and cannot allow me more than £2 for it; and if I am not satisfied, I can have my waste back by paying him for his trouble.

"I think photographers ought to know how they can be cheated. I was then using a sixty-grain bath, and he wanted to give me 27s. for twenty-nine ounces of ash and thirteen ounces of precipitate. I remember, when in a situation in London some years ago, I had precipitated the silver, &c., from the hypo in the same way for my employer, and he received not only the amount per ounce, but an assay note stating the quantity of gold it contained, and allowing for the same.

"Allow me to apologize for troubling you.—Yours faithfully,
ASHES."

There might be several explanations offered to meet the case described; but we fear that none of them would be regarded as probable or satisfactory. It is barely possible, if not probable, that refiner A made a mistake and remitted too much, whilst B remitted too little. The discrepancy between twenty-seven shillings and sixty-five shillings must certainly have resulted from a serious mistake, or something else equally serious. It is not, however, to discuss the possible mistakes in assaying, or in estimating fair profits of an individual, that we now refer to the matter. Our correspondent's case may be that of many, and our aim is to obtain a statement of experience from other readers as to their dealings with residues, either in reducing them at home, or in forwarding them to refiners. In large establishments we believe the system of reducing the residues at home is carried out with satisfaction; but we shall be glad to obtain, if possible, comparative results of reducing at home and sending to the refiner's, and especially to learn the experience of amateurs and portraitists conducting private businesses, who have systematically recovered the silver from wastes, either by reduction at home, or through the aid of the refiner.

IMITATION IVORY MINIATURES.

IN M. Liebert's new work entitled *La Photographie en Amerique*, there are instructions as to the preparation of coloured paper pictures which appear exactly like well-executed ivory miniatures, and which are especially noticeable for the freshness and clearness of their colours. The process is a simple one, and requires less trouble than the ordinary method of tinting by means of water-colours.

Steinbach paper is allowed to float for three minutes on a bath of—

Filtered water	...	...	1 litre
White gelatine	...	...	2½ grammes
Iceland moss in paste with sugar	10	"	
Chloride of ammonium	...	12	"

The back of the paper is marked with a pencil so as to be recognized. After drying the paper is kept in a portfolio, where it will remain good a long time.

The sensitizing of this paper takes place on an ordinary

silver bath made up to fifteen per cent. strength, and when the paper has dried, it should be used forthwith.

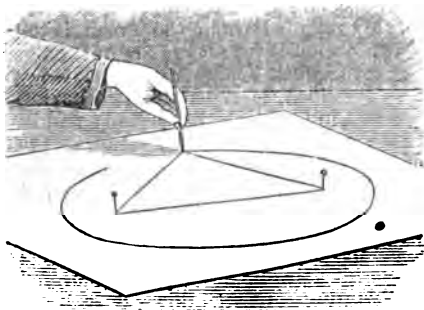
The printing is done by means of a vignette, the image being toned, fixed, and washed as usual. When it comes out of the washing trough, and before it is dry, it is strained upon a wooden frame, and as soon as it has dried in this position, it is coloured by means of water-colours. The picture is then placed on an even surface that is heated underneath with a spirit lamp, and the back is rubbed over with melted white wax. As much as possible of the wax is afterwards removed with a flannel, and when no more can be rubbed off, a sheet of straw-coloured drawing-paper is placed against the print, the paper being backed up by a piece of wood to keep it flat. Finally the picture is put into a *passepartout* of patent plate glass, with a gold border, or framed in any other suitable manner.

Thus finished and mounted, these pictures appear very clear and fresh, and have all the characteristics of a miniature painting executed upon ivory.

TO MAKE OVALS OF ANY SIZE.

A SIMPLE and old-fashioned mode of striking an oval without the aid of instruments may be useful to many of our readers. The method, which, we believe, is known to most workers, has been so many years familiar to ourselves, that we should scarcely have thought of describing it; but a recent conversation amongst a dozen educated men on the subject showed it to be so little known that we determine to repeat it for the benefit of our readers. The diagram was recently given in the *Scientific American* :—

To make an oval, tie together the ends of a thread or string. Two pins arranged within the loop, as shown,



govern the size of the oval, which is marked upon the paper by means of a pencil carried against one side of the loop as indicated. The dimensions of the oval may be made larger or smaller, as desired, by enlarging or diminishing the size of the loop. Elliptical mounts, matts, masks, &c., may be accurately made in this way.

LIGHT A MECHANICAL FORCE: MR. W. CROOKES' REMARKABLE DISCOVERY.

BY W. T. BOVEY.

THE great Sir Isaac Newton gave utterance to no idle lament when he likened his truly wonderful performances in the arena of science to a child gathering pebbles on a seashore, whilst a boundless ocean of unexplored mysteries stretched far out beyond the horizon before him; for, however richly endowed with mental gifts a man might be, his most strenuous efforts to gratify his cravings for knowledge develop the fact that a long lifetime spent in such labour only succeeds in exposing the vastness of his own and all other men's ignorance; that matured knowledge, although upreared by much thinking and patience, is, as a rule, the immediate offspring of those unlooked-for accidents called chance. A lamp swung to and fro as it hung suspended from the cathedral of Pisa; and Galileo, as he curiously watched the oscilla-

tions, obtained therefrom his earliest ideas concerning gravitation. An apple fell from the bough of a tree; and Newton was thus inspired to complete the work which Galileo had begun. These and a thousand other instances, on record, of a similar character, prove how slight an impetus is needed to direct an observant mind in the way of progression; and yet how faltering must necessarily be the footsteps of every earnest explorer, because of the experiences of that past where theories, which at the time of their conception were regarded as inlestructible, crumbled into the rottenness of error and oblivion at the withering touch of some newly developed truth; and it is not impossible (nay, I hold it as a doctrine more than probable) that Mr. Crookes has struck a death-blow to a portion of a belief we have inherited concerning the nature and constitution of solar optics. From Newton's day even down to the present time, solar light was and is religiously regarded as a make up of composite rays, viz., heat, light, actinism; or, as represented by colour, red, yellow, blue. The prism, by analysis, has betrayed the latter fact, whilst the thermometer and photography are regarded as faithful supporters of the former proposition. The eye has seen, the mind has cogitated, and is satisfied. "Habet, down with the thumbs. Why seek further knowledge? Each solar ray hath its refractive, reflecting, chemical, and heating qualities, calculated with mathematical exactness; and modern opticians will bend you a ray of light into very curious angles. Surely, these being accomplished facts, our present knowledge of solar physics cannot be aught but perfect." To reasoners who would give expression to thoughts such as I have imaginatively quoted, I would say, science is the resultant of reason, and reason is too often a misguided sophist, which twists through a wilderness of doubts ere it succeeds in elucidating absolute facts. Our present views concerning the nature of light might dovetail in with practically demonstrated phenomena. They are, however, too abstruse, too complicated, too full of inconsistencies, to harmonize with the beautiful simplicity observed by the Maker of all things in the arrangement of His marvellous, and in many respects incomprehensible, works.

It is given to men to see the internal economy of nature's machinery in brief glimpses; hence the reason why that the stages of knowledge are separated by a span of years. Newton in his day was privileged, and the world was thereby enlightened. Since Newton's time others have gone over the same ground, and modified ideas from time to time have thus been obtained—notably, the undulatory theory, first proposed by Descartes, and subsequently in an altered form adopted by Huygens, Euler, and our own able countryman, Dr. Young; and, in reference to the discoveries of these and other explorers, it is worthy of note that whilst they have handed down a missing link as a legacy to philosophical thinkers of the present, they succeeded in laying down truths which no future discoveries can destroy; hence we hail the advent of Mr. Crookes, not as one who will remove the landmarks we cherish and love, but as one who points toward a more perfect knowledge, inasmuch as his clever invention provides a reasonable clue which, followed up as it will be by recondite minds, will ultimately extricate facts from inconsistencies, mysticism, and involuntarily-conceived doubts.

Briefly, the wonderful little engine to which I have more than once referred in my prefatory remarks, and which has so thoroughly succeeded in puzzling our savans of science, might be described as a marvel of ingenious contrivance, consisting of a glass tube having a bulb blown at one end, which is completely exhausted of air by means of a Deringer air-pump. Within the bulb is mounted in vacuo two light straws that cross at right angles, with a disc of elder pith at each of the four arms or extremities, one face of each disc being blackened, the other left white. On exposing this little machine to the action of light, the

arms revolve more or less rapidly, according to the nature and intensity of the light, which, for the first time, is seen to possess some mechanical force; and as the tiny engine whirls its marvellous rounds, science, with feelings of astonishment, looks on, and is sorely perplexed to account for the cause of so unlooked-for a phenomenon. And it is on account of the temporary bewilderment referred to, that I with much diffidence adventure to step upon the platform to give some description of a matter that has provided me with material for observation and meditation for many a year. With no other laboratory than that of my mind, with none other guide than my own observations, it is possible that I have arrived at erroneous conclusions; but, as the final finding actually accounts for the motive power visibly developed by Mr. Crookes' machine, I am encouraged to hope that my recital might be read with some interest, even though doubts may be raised concerning the accuracy of my views.

When I first embarked in my calling as a photographer, I made it a subject of searching inquiry, and by unwearied study I endeavoured to understand the theories, both chemical and optical, which had been written upon and accepted by the most distinguished men of that time. Nor was it long before I felt gravely dissatisfied with accepted views relating to actinism, inasmuch as my practical observations detected inconsistencies which the standard works on what I will term chemical optics could not explain; as, for example, the solar rays, when at their hottest and brightest, were sometimes almost entirely void of summer-like actinism, whilst at other times, when the thermometer averaged 60°, as in some days of the months of April and September, the actinic power was at its maximum of vigour. At first I attributed the change to an absence of moisture in the paper, but on pushing my inquiries I from various sources learned that similar experiences had befallen clever workers with the camera and wet plates. I then commenced a series of observations on the effects produced on persons of nervous temperament by the presence or absence of actinism, and duly noted the influence exerted by light on flowers and plants. It would weary my readers were I to describe the tortuous track pursued by my thoughts ere I reached a final conclusion. I will therefore at once to the point, by explaining the heterodox views which I arrived at, in spite of my wish to be loyal to my earlier impressions.

To make a clean breast of the matter, I must confess that I discarded belief of the tri-corded light, as it did not harmonize with my practical experience, nor, to my mind, was the idea in keeping with the beautiful mechanism of creation. I could not realise a lively faith in the existence of distant planets, eternally frozen up in a lifeless torpidity, induced by a ten thousand times intensified cold; nor could I believe in a sun which capriciously shoots forth its rays without constancy of quality, now weak, anon strong in chemical power; in short, this savoured too much of random. I tried hard to reconcile these discrepancies by following up the accepted belief concerning invisible and intervening mists, but extended observation convinced me that, under all conditions of atmosphere, the variations of actinic force were apparent. Hence I at length placed actinism under a less distinguished category; and in lieu of its being a direct emanation from the sun, I now recognise it as a resultant, which owes its force to its antagonism to the solar ray proper. And now to dove-tail this idea with other and generally accepted theory.

That which philosophers describe as ether I regard as a normal electric fluid, which encircles the earth, and, like ozone, is changeful in quantity. This fluid, in a state of quiescence, is latent; in other words, cannot be detected by the most sensitive of electrometers. The solar rays excite this fluid, being repellent to each other, and such antagonism would naturally create undulatory movements. And on the rapidity of those undulations depend the

intensity of heat and of light. My proposition, therefore, is that—

1st. The yellow ray is the true solar light.

2nd. That the red ray is the result of undulations of inconceivable rapidity, which develop heat, and ultimately change to uncombined electricity.

3rd. The blue, or actinic ray, subjected to a less violent agitation, is excited without losing its combined qualities, hence chemical force is developed, which lessens as the waves of motion grow slower at the edges, and in this proposition is accounted for the phenomenon of chemical force being found beyond the visible rays, as perceived on the violet end of a spectrum, whilst the idea of an existing repelleny would give some reason why those violet rays are known to extend further in length than others.

Now, if we take the views as I have faintly—perhaps imperfectly—propounded them, we at once can find some explanation why chemical force is often at its weakest when the solar rays are most powerful; and, further, we are not at a loss to understand why plants turn their leaves towards the sun, as such leaves are peculiarly sensitive to the attraction of free electricity. Nor shall we be unable to account for the reason why the dandelion opens so wide its petals when sunshine is full upon them. All yellows more or less repel the chemical rays, whilst transparent substances of that colour give free passage to the free electricity; and here we have an explanation why yellow glass produces “chemical darkness.”

To return for an instant to Mr. Crookes' machine. If my views are able to bear an instant of sober investigation, the little gossamer mill should move briskly in direct sunlight; should stop, as if in darkness, if exposed to the true violet ray; should go on again in red or yellow light; should be visibly retarded when the green is the motive power. Now, curiously enough, the marvellous little engine, when set to work behind glasses tinted with the colours just described, is reported as behaving in its working just as I in theory had expected; and it was not until I read that description which followed the earlier report given in the *Telegraph* that I mustered up courage to pen these lines. On mooted the question now entered upon to our esteemed Editor some three or four years ago, he evidently considered the time had not arrived for the publishing of my theory. But as the marriage service states it concerning wedding, “for better or for worse,” so I, having during my scientific career been wedded to the pages of the *News* for better or for worse, therefore select those pages as a fitting medium whereby I might, without loss of character, bear the basting which I fully anticipate after publication of my present heterodox disclosure.

I might add that my views are entirely consistent with and are explanatory of those dark bands which constitute the phenomena known as spectrum analysis. But with this matter I may not now deal, as I fear I have already gone beyond my usual trespass on space.

PREPARATION OF GLASS FOR NEGATIVES.*

GLASS plates are in general use as a basis for collodion pictures. In some places—America, for instance—sheet iron is employed in the practice of ferrotype, which is covered with a coating of permanent varnish, and then serves as a support for the collodion picture; and there are rare instances of waxed cloth being used in a similar way. These latter are known by the name of panotypes, and have the advantage that they are very rapidly produced; but they are not likely to take the place of pictures produced upon paper by means of glass negatives.

The choice of plates for the negative process is not an easy one to make. We require them to possess a certain amount of resistance against chemicals, and this power of

resistance is not always present. Glass has naturally a hard film or skin upon the surface, and, on grinding, this horny crust is removed, and the softer material underneath laid bare. For this reason patent plate, which is often chosen by reason of its uniformly flat nature, is more open to attack from chemical solutions than the ordinary crown or sheet glass. These, however, require to be handled with care. No solution, or even water, should be allowed to dry upon the surface. Sheet or Rhenish glass, besides little imperfections upon its surface, possesses a certain curvature extending throughout the plate. We are in a position, however, to render this curve innocuous, even if we cannot remove it. If, for instance, the hollow surface is employed for the collodion, the curve of the glass is somewhat remedied, when the negative is put into the dark slide, by the pressure of the spring. But as the focus of an image, especially when a portrait lens is used, is in a curve, the form of the glass plate is well adapted to the reception of a sharp image. In the case of smaller plates the question of curvature is of little importance, because of their limited dimensions; and for this reason it is seldom that plate glass is employed. When, however, large pictures have to be taken, or plans and maps have to be carefully reproduced, then patent plate must, as a general rule, be employed.

New glass requires to be thoroughly washed, first in acidified water, and then in ordinary water. Glass that has already been employed must be first of all freed from the varnish and collodion films upon it. This is easiest done by steeping in a concentrated solution of soda. In one or two days the films will be perfectly soft, and the glass is then transferred to a second bath made up of—

Commercial nitric acid	...	...	1 part
Water...	...	...	1 "

Or, what acts more energetically still—

Bichromate of potash	...	...	1 part
English sulphuric acid	...	...	1 "
Water...	...	...	15 parts

A period varying from six to ten hours is sufficient to free the plates completely from all organic matter. The plates are then washed, the edges, especially, being thoroughly rubbed with a linen rag. It is a good plan, indeed, to file the edges of the glass, before it is used, with an old file, so as to make them more easy to handle, and to provide for the collodion adhering more surely to the plate.

The plates are placed upon a drying-board to drain, and are then dried with a cloth, and are ready for polishing. This may be done in many ways, alcohol, tripoli, or old collodion being used for the purpose. The best polishing material is, without doubt, that mentioned by Professor H. Vogel. A few drops of ammonia are put upon a plate, and this is rubbed over with a linen rag, a second rag being afterwards used for the purpose. In this way even dirty plates may be cleared at a pinch.

In order that the silver bath may be kept pure and uncontaminated, it is always well to keep the back of the plate perfectly clean; and to ensure this a cleaning-board or cloth should be used for placing the plate on. After this the plates are ready for coating with collodion, for only dust particles will be found resting upon the surface—easily removed by the application of a dusting-brush. A polished plate, however, it should be borne in mind, will only remain good for four-and-twenty hours, and after that period should not be used without being polished a second time. For this reason many coat their plates with a protective solution of albumen, or gutta-percha, or some such material; and in this case there is no need for so careful a polishing in the first place. Indeed, the albumenizing of a plate may be undertaken immediately after the last washing. The water in which the plate has been finally rinsed is removed by pouring over a little distilled water, and the albumen solution is then applied twice

running over the surface of the glass. The plate is afterwards placed to dry. If there is no object in saving the labour of polishing when a preliminary coating is used, but the operator only desires to get ready a provision of clean plates for after use, it is well to polish the glass surface in some degree, and then to apply the albumen solution by the aid of a broad camel's hair brush. In this way you prevent the back of the plate becoming soiled with albumen, and thus contaminating the dipping-bath. Plates coated with a film of albumen are dry in a dozen hours, if left in a suitable locality free from dust, and may then be collodionized, or, if needed, kept for twelve months before they are used. One great advantage of employing an albumen substratum is the circumstance that old and almost worn-out plates may be used again if thus protected by an albumen coating.

The albumen solution is made in the manner following. Fresh white of egg is mixed with an equal quantity of ammonia, and then beaten to a stiff froth, after which it is covered up and allowed to stand. In a few hours' time the fluid portion is poured off into a bottle for preservation. Of this one part is taken, and mixed with twenty parts of distilled water; the whole is filtered, but in such a manner that the solution is allowed to run down the length of a glass rod, as otherwise air-bubbles would infallibly be formed. The concentrated solution may be kept for weeks, and can be used, even if it does not smell altogether sweet. It must be filtered, however, when used, and should afterwards be thrown away. Sometimes it happens that plates which have been albumenized show a number of little dark spots upon their surfaces, and these are due to fungi caused by the albumenized plates having been kept in a damp place. If any phenomena of this kind are observed, the plates must be washed, and albumenized once more.

The coating of glass plates with gutta-percha solution is exceedingly simple. One part of raw gutta-percha is dissolved in ten parts of chloroform, and of this solution one part is diluted with one hundred parts of light benzine. This liquid, when filtered, is poured upon the washed and dried plates in the same way as collodion, and five minutes after the operation the plate is ready to be collodionized. Unfortunately, when the solution happens to be a little too strong, or when certain kinds of glass are used, the film of the picture is apt on drying to peel right off with the gutta-percha substratum. M. Schaarwachter, of Berlin, however, who was one of the first to employ this kind of substratum, has now used it for a considerable period, and with much satisfaction.

Before applying the collodion, all plates, whether treated with albumen or gutta-percha, should be carefully freed from dust, by passing over them the dusting brush very lightly. Lastly, it is scarcely necessary to mention that all photographic glass must be as free as possible from imperfections, and should be of a soft nature.

PHOTOGRAPHING THE INVISIBLE.*

At a meeting of the Vienna Photographic Society held a short time since, there was read a communication from a photographer at Innsbruck, in which it was stated that a portrait of a lady had been secured, showing spots over the face and hands which were not visible upon the model at the time she was posed. The sitter a few days afterwards became covered with smallpox marks, and these corresponded with the spots upon the negative.

We are not in a position to enquire into the truth of this appearance, but we must here express a doubt of its veracity, at the same time we are bound to admit that similar things have been noticed before. As far back as 1864, a subject of the same kind engrossed the attention of the Berlin Photographic Society, when M. Prümm described that a lady had accidentally been photographed a day before she fell ill of the smallpox. Upon the face in

* *Photographische Mittheilungen.*

the picture were many spots which were invisible upon the original at the time of the pose, but which became very prominent the next day when the disease broke out. Dr. Vogel then remarked that perhaps photography might be employed in obtaining a diagnosis of a patient under some circumstances.

It is unknown to us whether any use has been made by the faculty, or any experiments conducted to clear up this point, but the matter seems to us worthy of investigation, for we know with what surprising accuracy the photographic film reproduces details which are scarcely perceptible to the human eye.

We remember, for instance, the case of a Berlin photographer who, in copying an old map, found a lot of little dull white spots with dark margins, whose presence could not be accounted for by any defect in the photographic process. The circumstance that these spots appeared in every negative in exactly the same place led to the discovery of the cause of the phenomena. The original was very carefully examined, and there were found a large number of fine yellow spots that were scarcely visible to the naked eye, and these corresponded to the positions of the spots upon the negatives.

M. Prumm, who found this out, remarked that a year previously the same experience happened to him. He had to take a landscape picture which, among other things, included a white building. On the negative there was plainly to be seen writing of some kind upon the white-washed wall, while, at the same distance from the original, nothing of the kind was observable. It was only when you approached very near to the house that writing was perceptible in matt characters under the whitewash.

In Italy, indeed, the camera has been used to good purpose by making use of this special feature of photography. Old oil paintings have been copied on purpose to find out the places where they have, at later times, been painted over, it having been found that the photographic lens is a much sharper observer than the human eye in this particular.

The Library at Brussels possesses a rare manuscript, of which a large portion has faded away, and has been unreadable for the past three centuries, so that in its present condition the MS. is very incomplete. The French Academy was asked to assist in deciphering the faded pages, but this learned body had to give up the task in despair. Finally, the idea struck the authorities to have the document photographed; and behold! the camera revealed what had not been seen for generations past.

A similar observation was made by M. C. Silvy, at the time of the London Exhibition of 1862, when that gentleman copied the "Manuscript Sforza." This MS. was so pale that the characters were scarcely to be recognised; but on being photographed the writing came out quite clear and legible.

The value of photography, therefore, in aiding to decipher faded prints is obvious, and the services rendered by the camera in this way deserve to be borne in mind.

ELECTRICITY AND THE PHOTOGRAPHIC IMAGE.

BY MAJOR FLORIDA DUMAS.*

I AM thoroughly convinced that everything acts in nature by vibrations, and that the result produced upon the sensitized collodion film by an object exposed before it is brought about by vibrations which the object produces upon the collodion. In my opinion all calorific, electric, luminous, and magnetic effects are produced by the differences of intensity, or direction of the vibrations, of one universal agent, which may very well be that which we term electricity.

Without entering at length into any theoretical exposition

of my idea, I have thought that if the effect produced upon sensitized collodion exposed in the camera is really a vibratory movement, by producing in the collodion a movement of the same character I should be able practically to reduce considerably the time of exposure, or to operate with a light much more feeble than that usually employed. The production of clichés in colours might be produced in such a way, like one which I secured accidentally at Rome on one occasion, and which I have never been able to secure a second time.

By way of encouragement to persevere in the path I had struck out, I first of all proved that collodion is a bad conductor of electricity, but that the more sensitive it is, the better its conductivity becomes. This proved to be invariably the case with all the collodion I tried.

It was a difficult matter, I found, to make an electric current pass through a collodionized plate when in the camera. In this I failed altogether. Whatever method I adopted, the galvanometer was always motionless, and no current passed.

I have determined to commence my experiments anew, beginning with the metal Daguerreotype plate; but I have not yet had opportunity to take up the subject again.

I do not know if other experimenters have tried to operate in photography with the aid of electricity; I have sought in vain among works on photography in order to gain some experience in the matter. Hitherto I have not said anything of my researches, because a negative result proves nothing; but now that I am leaving the War Department Photographic Establishment at Paris, I consider it a duty to point out what may be an interesting and useful study for anyone to undertake, and what remains to me in the shape of a philosopher's stone.

The idea that electricity influences the sensitive film is not a new one, for M. l'Abbé Desprats began shortly before his death an investigation of the nature of the electric currents produced during the development of the collodion film. In 1860 M. Auguste Testelin published a pamphlet called "Essai de théorie sur la formation des images photographiques rapporté à une cause électrique;" and M. E. Becquerel published a work upon the electric effects produced under the influence of the chemical action of light which is included in his "Traité de la lumière," and in which he alluded to electric currents produced by the decomposition of chloride, bromide, and iodide of silver. It is to be hoped that now Major Dumas has called attention again to the subject, investigators will once more give the matter consideration.

Correspondence.

DEVONSHIRE SCENERY.

SIR,—Who has not heard of Devonshire lanes, maidens, and cream? The beauties of the two former have been sung by our poets, and immortalised in prose and verse. As for the latter, its delicate lusciousness invariably leaves piquant longings in those who have once tasted it, that ever and anon have to be gratified by sundry sealed tinsful being sent to town or elsewhere through the post. With these things uppermost in W. A. C. A.'s mind, I do not wonder at him, after conquering all the beauties of the Continent with his camera, wishing for one more to conquer that shall excel all others in beauty. Now I intend to "place" your correspondent and many others that may like to follow him just in the spot where some of these things, photographically speaking, may be enjoyed to the full. I cannot promise him that, if he is a bachelor, I will engage to point him out the most beautiful maiden, or where he can get the most delicious cream; but this I will do—in a few short sketches, about a column in length, will direct him to some of the most lovely spots that have ever been brought under the Cyclopean eye of the camera.

* Read before the French Photographic Society.

Your correspondent has chosen North Devon for a few weeks' summer tour. Well do I approve of his choice. For soft and delicate beauty in lanes, slopes, and dells, as well as the bold and rugged grandeur of its coast scenery, it immeasurably surpasses the South of Devon. I state this from personal observation and experience. A large number of these places I have photographed. Stand on the tors at Ilfracombe, and listen to the music of the ocean, and watch the delicate rays of the setting sun striking on its creeks and caverns of rare beauty. From thence pass round the rocky bend of Morte Bay, with its bold and bluff cliffs of massive grandeur, to Westward Ho! There stand in wonder and admiration, as you must, on that long ridge of pebbles, stretching in an unbroken line along the edge of the sea, for two miles and a half, forming a barrier to the Atlantic rollers as they come up angry and unchecked to spend their strength on its ever shifting slopes. Away far out in the Channel, hanging as a soft hazy cloud in a summer sky, is Lundy Island, almost a *terra incognita* to photographers: teeming with wild and weird granite rocks. Far down in the bend of the Bay, looking like a long silver thread amid the dark masses of green, is Clovelly. Who has not heard of its sylvan retreats of singular beauty? Poets, artists, and photographers have alike vied with each other to make known its charms. Beyond a jutting far into the Channel is the broad shoulder of Hartland Point, against which, almost every winter, some noble ship has been dashed and shattered to pieces. Happily, during the past winter, the Trinity Board has placed a lighthouse, which it is hoped may avert similar catastrophes.

From the above points, a few miles inland, any photographer, to be busy, would have not only weeks of work, but months. I would recommend, as two good central spots, Westward Ho! and Ilfracombe. Say a fortnight's stay at each place, would enable any one to get a good many negatives of some of the choicest bits of North Devon scenery. Westward Ho! is a new and rising watering place, and has many charms of its own. From thence Appleton, Bideford, and up the Torridge to Torrington, each of these are within easy distance, and all have distinct points of interest of their own. Then Clovelly can be taken, Hartland Abbey, Hartland May, and the Point, as well as the rocky coast scenery. Ilfracombe has many charming bits of its own. From thence run up by boat to Lynmouth, which is one of the most beautiful sylvan retreats that can be imagined, where every bend and turn forms a picture. Having pointed out the route, I will proceed next week to point out the spots of greatest interest worth photographing, interspersed with a few practical hints.—I remain, sir, yours respectfully,

THOS. TEDRAKE.

Bideford, May 4th.

DEAR SIR.—If you think the following will be of any use to "W. A. C. A.," please publish it.

I think as good a place as any in Devonshire is Lynton, some ten or fifteen miles north of Barnstaple. Quite near are the Valley of Rocks, Waters' Meet, &c. The scenery is magnificent; here you have the sea, forests, mountains, and waterfalls all at hand. If you wish to live well, there are many good hotels; but if reasonably, a very comfortable little halting-place, very conveniently situated, called the "Cottage Inn," can be found at Lynn Bridge, about half a mile before arriving at Lynton.—I am, dear sir, yours truly,

S. P. Q. R.

PAPER NEGATIVES.

DEAR SIR.—Referring to William Brooks' letter, mentioning that he had been taking paper negatives for some two or three years, I think it will be within your recollection that in the Exhibition of 1866 or 1867, I exhibited some photo-silk banners of large dimensions; and as I was then working photography on textile fabrics, I beg to say

that all these were printed from paper or calico negatives, and I have still one by me that measures six feet by four feet—rather large and expensive if taken on plate glass. Mr. Blanchard, as I understood him, only brought forward the method or adaptation as one worthy of greater publicity, and not as anything particularly new, and I can endorse all he has said, and would add one word, and that is, when only one or two copies are required from a paper negative, there is no necessity to print it so dark, and waxing may be dispensed with altogether, the only caution being to keep the negative and the sensitive paper dry.

Referring to another subject, will your able correspondent Mr. George Willis kindly favour me with fuller details of his method of obtaining transparencies, as described in the present YEAR-BOOK page 68? I presume 120 grains of sulphate of copper is intended, not 120 ounces. Also whether they require 20 to 30 minutes exposure, or 20 to 30 seconds. I have not been able to obtain any successful result with the latter exposure.

In conclusion, sir, permit me to thank those correspondents who have so kindly forwarded me samples of nitro-glucose in response to my last communication.—Yours truly,

G. HOOPER.

68, Canonbury Park, South, N.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held at the Free Public Library, William Brown Street, on Tuesday, the 26th ult., Mr. W. ATKINS, Vice-President, in the chair.

The minutes of the former meeting were read and confirmed, and Mr. E. Twigge and Mr. Ed. Whalley were elected members of the Association.

Votes of thanks were unanimously passed to Mr. F. York, Mr. C. Dawson, and Mr. Knott, the success of the lantern exhibition at the popular meeting being mainly due to their contributions and assistance.

A number of Mr. F. York's lantern slides were handed round, the subjects being very amusing—groups of children, &c., taken from life.

The SECRETARY recommended the members to try and produce similar pictures. The ingenuity to be displayed in grouping, combined with their novelty and character, would render them more interesting than the usual photographic work.

Mr. THOMAS CLARKE then read a paper on "The Beer and Albumen Process" (see page 220). The paper was illustrated by several whole-plate negatives and transparencies, showing the excellence of the process. A vote of thanks was afterwards passed to Mr. Clarke for his paper.

The Rev. G. J. BANNER exhibited three of Burgess's gelatine plates which he had exposed and developed that morning. He had had them for two years, and they showed their keeping qualities by developing perfectly clean and well.

The Rev. H. J. PALMER said that, finding he could not get intensity with the rapid plates prepared by Mr. Kennett's gelatine emulsion, he had written to Mr. Willis, of Scarborough (who had been so successful in taking interiors with them), asking him if he would object to give his method of development for the benefit of the members. Mr. Willis kindly replied, stating that he found no difficulty in getting any intensity, provided that the plates were first placed for five minutes in a solution of twenty-five grains of bromide of ammonium to a pint of water, and afterwards in plain water previous to development. He (Mr. Palmer) found Mr. Willis to be right, and he would strongly advise the members to try the process, which was a very easy one when mastered.

Mr. ATKINS showed two stereoscopic transparencies mounted with glass coated with the varnish-colloid opal backing. There was one drawback with them—the transparencies had to be reversed, or the picture had to be looked at through the backing. He (Mr. Atkins) said he had no difficulty in obtaining an even film if the mixture were well filtered and the glass free from dust.

The Rev. H. J. PALMER exhibited and explained the method of working one of Mr. Edwards' graphogenic cameras, which he

(Mr. Palmer) afterwards presented to the Society, and for which he received a hearty vote of thanks.

It was decided that there should be an excursion to Lymm on Wednesday, the 12th inst., and the meeting shortly afterwards adjourned.

Talk in the Studio.

DR. VOGEL'S DISCOVERY.—A long letter by Mr. Stillman appears in the last number of *Nature* referring to Dr. Vogel's discovery as to the actinic value of adding certain colouring matters to a film of bromide of silver to render it sensitive to the usually non-actinic rays. Mr. Stillman recalls the non-success of various able experimentalists in repeating Dr. Vogel's experiment, and suggests that such results as have been obtained may be due to other causes. It is scarcely necessary, however, to remark that many negative results in a new and comparatively little understood direction prove nothing. Further facts and repetition of the experiments under strictly test conditions may be required, which Dr. Vogel himself may be able to supply. His recent pressing engagements in connection with astronomical photography, and his absence from home in connection with the recent eclipse expedition, must necessarily defer his immediate attention to the subject.

MUSIC FOR SITTERS.—A correspondent of our Philadelphia contemporary suggests music as an aid to successful portraiture. He says:—"Volumes have been written how to manage our customers, but little has been said of the power of music in obtaining happy expressions. I have often wondered at it, and would like to draw the attention of my photographic brethren to this fact. Everybody is influenced by it, and while you are listening to a well-known and familiar air, the time of the sitting seems to be only half as long, and the awkwardness of the situation is forgotten. Shakspeare says:

'The man that hath no music in himself,
Nor is not moved with concord of sweet sounds,
Is fit for treasons, stratagems, and spoils;
The motions of his spirit are dull as night,
And his affections dark as Erebus:
Let no such man be trusted.'

I leave it to my ingenious brethren how to administer it (piano, good music-box, &c.), and if they then, in spite of it, get a customer with savage looks, say, with Shakspeare, Let no such man be trusted,—make him pay *the whole* in advance!"

CAMERA-OBSCURA ON THE RAILWAY.—An American paper says:—"Among recent curious inventions is the application of the camera-obscura to a railroad car, imparting to the travelling and wondering beholder a moving diminutive picture of the country through which he is passing."

PAINLESS PHOTOGRAPHY.—A Danbury photographer promises to revolutionize the business by the introduction of a gas which renders the sitter unconscious during the taking of the picture. He has already issued cards announcing "Photographs in all styles taken without pain."—*Western Photographic News*.

To Correspondents.

A LADY.—Various methods have been adopted to give a high surface to carbon prints, and amongst others varnish may be employed; but the varnished surface is by no means really pleasing to an artistic taste. The plan of enamelling as applied to albumenized prints may be employed if you like the highly glazed surface. Mr. Blanchard recently described a method which he has found successful. It consists in burnishing the surface by means of a Weston burnisher. It is important in such case to adopt two precautions: one is to use the burnisher very hot without too much pressure, and the other to dry each print before the fire immediately before burnishing, as the material of the image so readily absorbs moisture from the atmosphere, that unless it be so dried it is apt to be injured in burnishing. If you wish to try varnishing, an ordinary negative varnish may be employed, in the same manner as it is applied to a negative. When the prints are developed on a piece of plate-glass they retain a fine surface after transferring.

HOPE.—It is probable that the distilled water was not absolutely pure, a circumstance by no means uncommon. Your best plan will be to neutralize the bath by means of carbonate of soda; pour it into a dish and submit it to the action of sunlight for a day or two, or a few days if you can spare the time; then filter carefully through pure cotton-wool, and try again. We do not like the plan of iodizing by means of a collodionized plate, although it is very commonly used. A mere trace of iodide of potassium or a drop or two of tincture of iodine is better in our experience.

A SUBSCRIBER.—The irregular lumpy film and morocco-like texture may arise from two or three causes. The presence of too much water, arising from the use of insufficiently rectified solvents, is a frequent cause; but, from your description of those employed, they can scarcely be so in your case. The same result will arise from an unsuitable sample of pyroxyline. Samples made at a low temperature, giving a thick collodion when very few grains to the ounce are used, are apt to give the coarse irregular film. This tendency is much increased by the sole use of cadmium salts. The same collodion salted with iodide and bromide of ammonium would probably give a better film, especially after a little ripening, which rapidly takes place when alkaline salts are used. When cadmium salts only are used a sample of cotton made at a high temperature, giving a limpid collodion and powdery film, should also be employed. Age may improve this, or mixing with a sample of old collodion giving a powdery film.

S. R. M.—Developing by means of a bath of iron solution, and fixing in a bath of cyanide, are not—or, rather, need not to be—uncommon. We have frequently used such baths when producing collodion positives. But they both possess disadvantages. For developing negatives the bath has the disadvantage of diluting the nitrate of silver on the plate, and so rendering it difficult to secure intensity, which depends much on the presence and reduction of the free nitrate on the plate. Some skilful operators use a dish for developing. The dish is made by cementing slips of plate glass round the edge of a piece of plate glass of the required size. In this case the dish being shallow, only just sufficient iron solution is used, and the extreme dilution of the nitrate is thus prevented. If you wish to use a dipping bath, take care that it is shallow, so as to avoid the use of a large quantity of iron solution. Remember that its developing strength is reduced by the immersion of every plate, and that it will require the frequent addition of fresh iron solution. The chief disadvantage of the use of a cyanide bath is, that it gives off fumes of hydro-cyanic acid, which are unwholesome. If the cyanide be used very weak, and kept covered up, there is no great danger. Watchfulness must be used, as, if the plate be left too long in the bath, the image will be attacked, which is not the case when using hypo in a bath.

P. R. G.—We have no means whatever of giving you the information you ask. Almost every professional enlarger has his own mode of working; but whether in the cases you mention, development or direct enlargements; or whether enlarged negatives are used, we are not able to say; nor can we say, of course, whether they will be permanent or not; but the presumption is, that proper care is used. For mounting such pictures nothing is better than glue.

BAISTOL.—By adding ammonia to your bath you have precipitated a portion of the silver as oxide, and left the solution weak and alkaline. Your best plan will be to sun the remainder, which will throw down any organic matter present. Then strengthen with nitrate of silver, and add a trace of nitric acid, so as to secure a faint alkaline reaction. Your bath will then probably work all right. For experiment you may as well try this method with a portion of the bath first.

P. P.—Want of intensity may result from many causes. Your bath may be too weak, or out of order. Are you using a new sample of collodion? The use of a thin collodion or a new collodion is a frequent cause, especially when the film appears thin, and not creamy. In this case add a portion of an old thick collodion, or the addition to each ounce of a grain of soluble cotton will aid you.

VENATOR.—Many thanks. We shall have pleasure in publishing the description in our next.

T. ERWIN.—Decidedly an improvement; but you must be careful, with this lighting, not to under-expose, and so lose detail and transparency in the deep shadows.

W. BROOKS.—Many thanks. We shall look with interest for details.

ALEX. HENDERSON.—The order for £1 2s. duly received. The account rendered was for £1 1s. 9d.

PADDY.—Thanks. In our next.

G. BRUCE.—We will endeavour to send some one as you wish.

F. GUTENST.—Received, many thanks.

J. ATKINSON.—Received, many thanks. We will write to you.

C. DE LAURE.—Thanks. In our next.

Several Correspondents in our next.

The Photographic News, May 14, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE SUMMER AND OUT-DOOR PHOTOGRAPHY—TEST PAPERS AND HOW TO PREPARE THEM.

The Summer and Out-door Photography.—Now that summer time has come again, and the woods and lanes have once more clothed themselves in their green drapery, those among us who are landscape photographers are naturally thinking about our summer campaigns. And since the dry process has been so much improved, and we can purchase plates commercially, better and cheaper than they can be made at home, the number of landscape amateurs has of late greatly increased, for going about the country with a camera and a packet of dry plates is a very nice and lazy way of enjoying oneself. When you are not bothered with a big dark tent, and have not continually to be on the look-out for a supply of water, the pursuit of landscape photography is a very pleasant one, and perhaps the most enchanting branch of the art to amateurs. There is a good deal of sitting down and considering, on grassy banks and underneath shady hedges, with the taking of every plate; and lunching in the open with a pipe or two, or upwards, are indispensable adjuncts to such pursuits. The circumstance that you never make a halt except in the presence of some pretty scene, is alone a guarantee that your journey will be a pleasant one; and the knowledge, moreover, that you are going to carry away with you a reminiscence of the leafy dell or mossy nook that has charmed you is a consideration tending to heighten your enjoyment. With all these advantages the dry plate photographer is, however, far from satisfied. He is an ungrateful being, for no sooner do you release him from most of the drudgery, than the lazy fellow wants to be freed altogether from hard work. He has now but a camera—stand and box of dry plates to look after, and still he is dissatisfied, and wants to be relieved still further of his *impedimenta*. He does not see exactly how he is to manage without a camera, or he would dispense with this apparatus; but why should he be compelled to carry heavy slides and fragile glass plates? he wants to know. You relieve him of his dark tent, of his chemicals, of his water supply, and goodness knows what else besides, and now he complains, when you give him a supply of ready sensitized plates, that the load he has to carry is still too heavy and breakable. We have taught our amateurs how to do with a little, and yet they grumble that they have anything at all to carry. "Now what would you have?" we asked a gentleman the other day, who complained that either he was limited in the number of views he could take in a day, or must needs have a sort of repeating back to his camera, as full of plates as the stereo-stands used for transparencies. His reply was brief and to the point. "I'll tell you in two words. Your dark slide should have a little cylinder on each side of it; in one of these cylinders place a roll of thin sensitive paper, and as you take picture after picture unroll sufficient of the paper for each negative, the paper as exposed being rolled up in the cylinder on the other side of the dark slide. When the whole roll of paper has been exposed, come home, cut it into bits where marks show the division of the plates, and develop. You would then merely have to carry about with you a roll of sensitized paper beside the camera and dark slide." This was the suggestion, and although not a new one, it is one that we shall not improbably see put into practice before we are much older. Talbot's early suggestion to employ paper for the negative may, after all, come to be the process of the future, and those who have experience of it, know what charmingly soft pictures it can give us. The fibre of the paper, which is the chief difficulty that stands in the way of securing uniform prints, may, since the improvements recently made in the paper trade, be in a position to be altogether overcome, and if this were the case, the landscape photographer, whether amateur or professional, would not be the only person to welcome paper

back again for negatives. The two chief disadvantages of glass—weight and fragility—would thus be obviated, and the travelling photographer would be made a happy man. We might have the material sensitized in rolls, in the same way as they do the carbon tissue now-a-days, and there would be no need for sensitizing and washing a number of plates every time dry films have to be prepared. This would be better even than employing the tough glass people have lately been talking about, and it would also do away with the necessity of discovering a thin, tough, transparent film for collodion support, for the invention of which the Vienna Photographic Society has offered a gold medal for the last three years. We shall have everybody turning photographers when all these improvements are made, and the advantages of alkaline development and emulsion processes will become subjects of every-day conversation.

Test Papers, and How to Prepare Them.—Some people imagine you can obtain test papers for almost every chemical reaction, and that in the same way as blue litmus paper is employed in testing for acid, so other papers stained with different materials or compounds can be secured suitable for making nearly every chemical test. M. F. Mohr, a German chemist, has lately published a good deal of information on the subject, and has enumerated the different kinds of test papers that may be found useful in chemistry, and the mode in which they are prepared. Many of these will be found useful to photographers, for there is no more simple test to be desired than the use of test papers such as these. In the preparation of litmus paper the litmus should be washed with hot alcohol, M. Mohr tells us, and then extracted with cold water; the colouring matter thus obtained being employed for staining the test paper. It is scarcely necessary to say that the paper used for the purpose should be freed, first of all, by washing, from any alkali or acid. Turmeric roots, it appears, contain two yellow dyes, but it is the one soluble in alcohol only which is affected by alkalies; the roots are washed in water until they yield no more colouring matter, and then they are treated with alcohol to extract the dye. To detect iron, M. Mohr recommends the use of paper soaked in sulphocyanate, or ferrocyanide of potassium. Bodies which act as reducing agents—such as the hyposulphites, iodide of potassium, sulphurous acid, sulphuretted hydrogen, sulphocyanate of potassium, oxide of iron, chloride of copper, &c.—may be tested with paper containing starch, moistened with a solution of iodate of potassium in oxalic acid, and dried. A starch paper moistened with iodide of potassium can be used for testing oxidizing bodies, and M. Mohr recommends that to keep the paper unchanged a lighted sulphur match should be held inside the bottle before closing the stopper. To detect ammonia gas, paper soaked in a solution of oxide of mercury is used; for sulphuretted hydrogen and sulphides of potassium and sodium, acetate of lead-paper, and filter-paper, soaked in chloride of cobalt. Metals that give black precipitates with sulphuretted hydrogen in an acid solution may be tested with washed sulphide of zinc, precipitated from the acetate, which is spread upon paper and dried.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER IV.

THE RECTIFICATION OF THE DISORDERED NEGATIVE BATH.

THE disorders to which the negative bath of nitrate of silver is subject, when properly used, are, it may be said, simply and easily and surely prescribed for, and it is only when, ignorant of its character and the disorders to which it is liable, the operator gropes in the dark, that the work of restoration is uncertain and vexatious.

To guard against the necessity of constantly renovating the negative bath, it has been advised that a large bath-

holder, with a correspondingly large supply of bath solution, be adopted, so that it requires little attention in weeks or even months. As it may at any moment arrive at that stage when it is found not to work properly, another bath, in working order, should be always in its place, which you can work when No. 1 becomes disordered. A third in course of renovation may, on the defection of No. 1, be restored and put in its place, while the disordered solution is treated in the manner to be described.

Whatever amount of silver you can set aside for the negative bath, be it great or little, or the baths with which you work large or small, depend upon it that it is much the simplest plan to have three lots of solution, one in use, a second quite ready, and a third preparing; by this plan you can never be taken at a disadvantage.

The Causes of Disorganization.—Generally, the first change in the bath is caused by an accumulation of alcohol and ether, causing a repulsion of the developer when flowed over the plate. This may be remedied in two ways:—1st, by adding sufficient alcohol to the developer to counteract the repelling influence of the alcohol and ether in the sensitizer; or, 2nd, by evaporating them by means of heat. The first method is only efficacious up to a certain point, and the presence of alcohol in the developer is not always beneficial. Place the bath in an evaporating dish over a stove until it commences to steam; alcohol and ether being much more volatile than water, are easily driven off—ten minutes steaming will be sufficient. If the solution is much reduced in quantity, and the strength at the time of taking it out of the bath is not weakened (as may be ascertained by the hydrometer, an instrument by which the specific gravity of liquids is tested), the solution, by the evaporation of the water, is strengthened; there being the same amount of silver as originally, and less water, it should be reduced by the addition of pure water, and filtered whilst still warm. This is done because iodide of silver is more soluble in a warm than a cold solution, and should any iodide be precipitated by heating the bath solution (which will only be in the case of an excess, when it is necessary to reduce the quantity), it may be filtered out in its present state; while cold it would be re-dissolved. Filtered, the solution should be perfectly clear; if not, it must be filtered again.

Fogging is the next disorder to which the bath shows tendency; a mistiness, or veiling in the shadows, that in developing, instead of remaining clear and bright after fixation, there is a deposit not caused by detail, which destroys their brilliancy. Fogging may arise from a variety of causes, ascertaining which the remedy is simple. Fog may be generally classified under two heads: chemical, that caused by impurities in the chemicals; and what is sometimes termed mechanical, as light improperly admitted to the plate (otherwise than through the lens) or from dirty glass, &c.

Taking the first, or chemical causes of fog, it may be found to veil the entire plate, lights (though not, perhaps, very observably) as well as shadows. In other cases it may entirely obliterate the image. If then the fog is universal, veiling the entire plate, and it is found that it is removable by a gentle rubbing of the finger or a tuft of cotton, without harming the image and film beneath, this is chemical fog, and the cause is to be found in the collodion, bath, developer, hypo, or in the manipulation.

If the fogging is but slight, try the other bath, which, if free from the fogginess, proves, as is most likely the case, that the fault is in the sensitizing of the plate; proceed as follows: pour the solution at fault into the evaporating dish or clear bottle. If the solution is discoloured, the probability is that dirt was the cause of the fog: remedy, filter. If perfectly clear, test for acidity; if absent, add a few drops of acid. If acid, test the strength; and if below thirty grains, boil up to that strength, and filter. If after

this treatment the bath works satisfactorily for a time, and again shows signs of fogging, it may be again and again restored in like manner, until simple boiling and filtering fails to remove the organic matter with which it is charged.

Under- and over-exposure, and too strong light shining on the lens, are also causes of fogging. With too short an exposure the silver reduced by the developing agent is attracted so slowly to the image that it falls on the shadows. *Remedy, more time.* When the exposure has been too long, the reduction of silver on the application of the developer is so rapid that the operator has not time to wash it off before the silver is attracted to the shadows as well as the lights. Of course *less time is the remedy.*

Temporary relief to a bath disorganized by the presence of organic matter can be obtained by adding a small quantity of a solution of permanganate of potash until the bath shows a violet colour. Place in the sun, in a white bottle, until clear, when the precipitation may be filtered out. Permanganate of potash in contact with the bath—the organic matter becoming oxidized—liberates permanganic acid, forming permanganate of silver, which remains in the bath, and is precipitated to the bottom in brownish-black flakes. The bath will require filtration and the addition of a few drops of acid after this treatment.

Mechanical fog can at once be detected from the chemical varieties as not being universal, but formed in irregular patches, marks, &c., and not being removable except with the collodion film. The plate, perhaps, is dirty: clean your glass more perfectly. The albumen with which the plates were albumenized may not be pure: in which case see that the eggs are quite fresh, and that the solution is filtered clear. Or the cause of fog may be found in dirty fingers or plate carriers: *remedy obvious.*

Pinholes caused by an excess of iodide in the nitrate of silver solution are very minute, of a regular crystallized form, and are distributed evenly over the entire surface of the plate. From pinholes caused by an excess of iodide those from dust are easily distinguished, being generally larger and of irregular shape, and not scattered regularly over the plate. The causes are numerous: dust in the collodion or on the plate before collodionizing; in the bath, where the plate receives the particles on its surface; in the carrier or on the dark slide, which, on being withdrawn, sets the particles flying; in the camera, and in other ways are these kind of pinholes produced. Search out the cause, and remedy it. Those from iodide may be plainly seen on the withdrawal of the plate from the bath, covering the plate like fine sand. Sticking to the plate, they prevent the reduction of silver falling on the parts they cover, and being afterwards dissolved in the hyposulphite of soda solution, leave the fine holes or transparent spots termed pinholes. *Remedy, dilution and filtration, and strengthening of the solution by addition of silver, or by boiling up to proper strength.*

(To be continued.)

COLOURATION OF STATUARY.

BY ROBERT H. BOW, O.E., F.R.S.E.*

THE purpose of this paper is to introduce a somewhat novel mode of treatment of statuary, being a much modified kind of colouration, dealing at most with two colours, and even using by preference the simple admixtures of black and white; and in order to show that this should be regarded as a very mild innovation, I may quote a few facts and opinions regarding the practice of the Greeks at a time when they had attained to their highest excellence in the sculptorial art.

The two most celebrated works of Phidias, the Minerva of the Parthenon and the Olympian Jupiter, were of gigantic

* Read before the Edinburgh Photographic Society.

size, and both composed of an immense number of pieces of ivory and plates of gold, the naked parts of the figures being of ivory, and the drapery and accessories of the metal. And, in the case of the Minerva, at least, the eyes were formed of inserted precious stones. Again, the renowned work of Polykletus, the Juno of Argos, was similarly built up of ivory and gold; and not only were the eyes frequently inlaid with metals, glass, and precious stones, but sometimes also the lips. Colours were also frequently applied to the eyes, lips, and hair, as well as to the drapery and ornaments. It does not appear, however, that means were used to give the appearance of complexion or rose-tint to the cheeks in the case of marble statues; but it is a curious fact that this effect was by some method imparted to some bronzes even of great excellence, the works of Praxiteles and other sculptors. The gilding of the hair in marble statues was a very common practice. These aids to the expression of the simple statuary appear to have been employed more or less throughout the three hundred years during which Grecian art maintained a high position, i.e., from the times of Pericles down to the fall of Greece to the status of a Roman Province; and we may therefore well suspect that our present notions of what constitutes legitimate art in sculpture are far too restrictive.

The ancient Romans in their polythitic work departed still farther than the Greeks from the simplicity of ordinary sculpture. They attempted to copy very closely the actual tints, by building up the statue with pieces of coloured marbles and alabasters; but we may pass over their doings as carrying less weight in questions of taste.

Owen Jones is of opinion that the Greeks used colour very generally, both on buildings, sculpture, and groups, and that even the flesh was coloured, but only conventionally, so as to avoid any attempt at direct imitation of nature.

I do not offer any arguments or opinions myself in favour of the use of a variety of actual colours even employed conventionally. Nor do I propose to apply the modified treatment to every piece of sculpture; for undoubtedly there exist many beautiful statues and groups in the case of which it would be felt by all to be sinning against good taste to modify in the slightest degree their uniform white surface, or to employ any obvious device by which the eyes or other features might be more forcibly indicated than results from a pretty strict adherence to the simple portrayal of the natural surfaces. But such examples are for the most part confined to those characterised by placidity of expression, and intended to convey ideas of repose, indifference, or patience: the eye is a blank in which it is left to the imagination of the beholder to picture the appearances of intelligence, and incapable of exhibiting the side-glance of coquetry, suspicion, or alarm; or of reinforcing the expression of the eyelids in the upward gaze of adoration, admiration, or surprise, or the downward droop of reverence and humility. And it must be borne in mind that in many phases of expression the eyelid and the eyeball contradict one another in action, as in coyness, cunning-watchfulness, and horror. These the sculptor cannot render or distinguish from some of the former without marking in some way the surface of the eyeball.

Statuary is confessedly weak in the rendering of the eyes. Were the eyeball modelled exactly according to nature, a very disagreeable effect would generally result from the light falling most powerfully upon the part where the pupil and iris occur, and thus rendering it lighter instead of darker than the rest of the eyeball. The most usual device to mitigate this reversal of light and shade is to make the curvature of the eyeball less instead of greater in front, securing at the same time a shadow from the exaggerated relative projection of the upper eyelid. But when the expression to be conveyed is active or passionate, the absence of the positive shades of the pupil and iris are such unequivocal blemishes, that the strictness of rendering is often still further departed from, especially by the modern sculptor, with a view to reduce the evil. This is most commonly done by drilling a hole where the pupil

occurs, so as to get a deep-cast shadow as a substitute for the positive darkness, and defining the circumference of the iris by a slighter ring-like cut. Another mode of treatment is to scoop out a saucer-like depression as large in diameter as the iris. Now no doubt these modifications may be claimed as the work of the sculptor's tools alone; but such a pretence would be mere quibbling, for the effect is got by a direct departure from the modern sculptor's first rule of art, which restricts him to the most accurate rendering of the surfaces that the material will permit of.

But it is not in the eye alone that the want of positive shade is felt. The eyebrow even plays an important part in the expression, and here also there is a reversed effect of light and shade: but the weakness is not so seriously noticed, since the eyebrow, though coloured, is not a mere surface indication, but has its form and position defined both by elevation and variety of texture. In the case of the mouth, however, much of the individuality of expression depends upon the form and position of the line where the carmine of the lips joins the skin-colour; this may be strikingly shown by changing that line in an actual face by means of painting the surfaces, or by painting variously the lips of casts from the same head; it is therefore a necessary and important feature in individual likeness, and it is somewhat surprising that the device of a fine cut has not been had recourse to for marking the outline of the deeper colour of the lips: I believe it is here, even more than in the eyes, that the difficulty arises in conveying the idea of likeness in portrait busts.

It might, perhaps, be possible to employ colour generally if in a very subdued manner, and under the skilful hand of a true artist, so as not to give rise to that feeling of repugnance produced by waxwork-like imitations of life. And some art-critics indeed think that Gibson succeeded in the case of his tinted Venus.

The unsatisfactory feeling produced by waxwork-like imitations of life is very striking, and it may be worth attempting to get some insight into its nature. Perhaps the solution should be found in this, that the art-character of the work should never be disguised, but that, along with the pleasurable or interested feelings called forth by the beauty or effectiveness of the representation, there should be mingled a feeling of admiration for the art displayed in the portrayal. Judged by this criterion, we can understand how unsatisfactory must be any attempt to produce an absolute representation of the reality of nature; for if by any possibility we were successful, we could regard the work merely as a substitute for the reality, and should miss the feeling of art-admiration; on the other hand, putting aside the impossible, the nearer we attempt to approach a verisimilitude of living nature, the defects in our work must become more numerous, more easily detected, and much more offensive, from the very pretentiousness of the sham.

It may be objected to this explanation that in the case of a painting on a flat surface the work is more admired the more perfect the delusion of its reality can be carried out; but here the imposition is not of the same absolute kind, and the art-admiration constitutes a large part of the pleasure experienced. Perhaps the peculiar nature of the deception attempted in the case of painted sculpture, or waxwork figures, may be brought more clearly out by the following consideration. When we see a mutilated ordinary statue, say one from which has been broken part of an arm or leg, we do not find the statue to become repulsive; but if this same statue were painted, and treated in so masterly a manner as to represent a living form very perfectly, I think it must be obvious that such a mutilation as I have supposed would become hideous. Now no similar feeling could be produced by a pictured figure merely mutilated by an accident to the canvas; it only presents itself as an injured work of art, exactly analogously to the mutilated unpainted marble statue.

(To be continued.)

THE PRACTICAL PRINTER IN AMERICA.

XXIV.

WASHING THE PRINTS.

THE prints, after they are removed from the salt-water bath, are then to receive the final washing, which will render them ready for the further operations, such as mounting and finishing. I would here most earnestly advise all printers to allow their prints to soak about ten minutes in salt water, before proceeding to wash them, as besides saving the annoyance of having blisters on them, they will also be much more easily washed.

This washing is the most important of any of the washings before mentioned, because if it is insufficiently done, the result will be much more disastrous than any of the others. The other washings were only to prepare the prints for other solutions, and it was not so important, as the silver would finally be removed in the fixing-bath. But in this case, when you discontinue the washing and proceed to mount the prints, they will then in the future be good, bad, or indifferent, according as to how the final washing was done. This destroying power which is so necessary to be removed is the hyposulphite of sodium, a considerable quantity of which still remains in the print. The theory of washing is that the water gradually displaces the hypo in the prints, providing the washing is permitted to continue long enough, and then the prints can be mounted and dried without any danger of bad results from further chemical action. The young beginner can thus see the necessity of frequent changes of water to remove this destroying agent, and hence it would be a good plan for the first half hour or so after the prints are fixed to wash them by hand, and then trust to the washing apparatus, whatever that may be. In small establishments this washing is done by permitting the water to run into a dish at one corner. When they are so done, it would be best to do as recommended, as they are likely to be all together the greater part of the time when thus washed.

Washing by hand can be done in the following way:—Take a suitably sized dish, fill about half full of water, and when the prints are removed from the salt water, place them in this bath of clear water with one hand, while with the other you place them under the surface. When the prints are all placed in this bath of water, then move them all about for five minutes, and then pour off the water and fill up again, and let them stay in five minutes more. Do this for four or five times more, using lukewarm water, as it will do the work quicker than cold, and then they will be ready to wash in the dish, as above described, by arranging the hose so that the water will run through and between the prints. When there are only six or eight scores of prints, they will be washed in a short time.

The great secret in washing prints is to keep them separated, thus permitting the fresh water to move between them all the time. In large batches—say twenty, thirty, or forty sheets of paper—this washing cannot be done in so simple a way as the above, hence it becomes necessary to have a washing-tank that will, on account of its peculiarly adapted make, wash the prints perfectly, and a longer or shorter time is required according as to how thoroughly the tank does its work.

To keep the small cartes from getting between large prints—say 14 by 17, and even larger ones—and thus getting imperfectly washed, a series of washing-tanks are arranged, a large one of which is intended for the washing of large prints alone, and a smaller one for the cartes-de-visite. Every photographic gallery has some sort of a tank which is intended for this washing, and I will mention here that these final washing-tanks should never be used for any of the other operations, such as the other washings, fixing, &c.

These tanks are more or less perfect in performing their work, but there is one idea that is generally carried out in them all, and that is to have an outlet in the bottom of the tank or tanks, so arranged that without sucking the prints

in, the water can be let out at the opposite side to where the fresh water is supplied.

To keep these prints in motion while washing, and thus make them "self-washing," a rotary motion is given to them on account of the manner in which the water enters the tank. A half-inch pipe generally runs along the inside of the tank, suspended midway between the top and bottom, and having small holes so made in it that minute streams of water strike the water obliquely in the same direction and at different parts of the surface, thereby causing the water to rotate around the tank, carrying the prints with it. The tank is so made that the diameter increases as it proceeds towards the bottom of the tank, so as to prevent the prints from sticking to the sides of it; and to be doubly sure that they will not adhere to the sides, there is on the under surface of the pipe an array of small holes running the whole length of it, sending small streams of water down the sides of the tank, driving away the prints which may be there. To prevent the apparatus from overflowing, an overflow is made, which, when the water has reached that level, it can be run off without danger of carrying the prints with it. But better still are those tanks which are got up on the siphon plan, and then when the water has reached the proper level (which you can regulate) it is all let off, leaving the prints on the bottom of the tank, which is, of course, so made as to prevent any hurt coming to the prints.

A washing apparatus got up on the siphon arrangement, and emptying itself every twenty or twenty-five minutes, is one which I used in a printing-room of an excellent gallery for a number of months. It slanted outward as it proceeded towards the bottom, for the same reason as was stated above, i.e., to prevent the prints from sticking to the sides. The pipe in it was arranged as was described above, and the bottom of the tank was covered with small pebbles about two inches in depth, which are or should be evenly distributed. Close to the bottom of the tank, on the side, a hole was made (hid from the prints by a piece of glass, the edges of which were ground smoothly), which permitted the water to pass through by means of a little iron pipe (varnished) two inches in length, which fits in exactly close to the wood. About an inch of this pipe projects beyond the tub, and a piece of suitable rubber hose is fastened and bent in the form of a siphon, the higher level of which is fastened by a wire in its proper position. When the water in the tub has reached the highest level of the siphon, the water, which has been gradually working up in the hose, will flow therefrom, and in a few minutes the tank will be emptied of the water, although there is a stream running in all of the time. The prints will be gently let down into the pebbles, and the water, after it has ceased to run out, will again cover the prints, and set them afloat before they have stopped draining. The supply water never should enter the tank nearly as quickly as the siphon carries it off when it has once started. No danger need to be apprehended from the drying of the prints while the tank is filling up again after it has once been emptied. For large prints this is not very good, especially if there are a quantity of them, but on the whole it is a very good arrangement.

In large establishments the prints are generally allowed to wash all night, and if there are many to be washed it had better be so done, unless the whole of the washing is done by hand, and then a shorter time will answer. Prints which are toned and washed Saturday afternoon should be washed by hand and mounted up before you leave the establishment for the night, as remaining in the water over Sunday will very much affect the prints; for, of course, they are not to be mounted on Sunday. In some establishments the printers do not print photographs on Saturday, but spend the day framing, making porcelains, &c., &c.

The prints should be tested before they are removed from the tank for the purpose of being mounted, to see as to whether they are perfectly washed or not.

Dr. H. Vogel, in his "Handbook of Photography,"

recommends a mode of testing which we will here give. First, we will give his mode of preparing the "Iodide of Starch," which is used in testing.

"One grain arrowroot is mixed with a few drops of cold water; next about 100 parts of distilled boiling water are poured on it, and afterwards 20 parts of chemically pure saltpetre are added to make the paste keep. To the solution of starch 20 grains of a wine-yellow solution of iodine in iodide of potassium solution are added (a bit of iodine thrown into a solution of iodide of potassium 1 : 20 will furnish this in a few seconds). This will give a blue solution of iodide of starch, which will keep for about four weeks. When the washing is finished, the pictures are separated under water, and a portion of the last water is taken from the box. For the purpose of testing, two test-tubes of equal size and perfectly clean should be selected; in each an equal quantity of a solution of iodide of starch should be filled; to the one tube fresh water from the reservoir is added; to the other an equal quantity from the last water in the wash-box. It remains only necessary to shake both tubes well, and to hold them against a piece of white paper in order to ascertain if in one of the tubes a discolouration has taken place. The greatest cleanliness of the hands and test-tubes is necessary. Even with a millionfold dilution the presence of soda can be detected. When the test shows that soda, or even a trace of it, is still present, the washing should be repeated. When we wish to test finished pictures by this method we must soak them first in water, and then test the water as described above."

Before you proceed to remove the prints from the tank let off all of the water in it, and rinse them well in a bath of clean rain-water, so as to remove all traces of the iron-rust and settlings from the water, which may have been carried in the tank through the supply. Rinse the prints in two or three changes, so as to get them as clean as possible, and they will be much nicer and cleaner when they are finished. When the prints are removed from the tank always rinse it, and fill up again with fresh water, and it will be ready for use next time. If the pebbles are used in the tank they should be washed every day. If the tank is made of wood, then once a week or fortnight let off all the water in the morning, and dry it thoroughly, and varnish all over the tank and pipe with some shellac varnish, and you will keep the tank in better condition by so doing, being more easily cleaned in the future from settlings, &c. Once in every two or three months scrape off the old shellac with a broken piece of glass, and varnish it anew. Too much care cannot be given to this, and in fact to all your tanks and sinks, for they should all be shellacked.

All of these little things help towards making fine work.

ANOTHER BATCH OF RECIPES.

WE select, chiefly from the pages of the *Scientific American*, another batch of recipes, the majority of which will be found useful to photographers.

HYPO AS AN INVISIBLE INK.—The main objection most people have to sending communications on postal cards is that the writing is, of course, open to general perusal. A good way of avoiding this difficulty is to use sympathetic ink. A solution of ten grains hyposulphite of soda in sixteen teaspoonfuls of water is the simplest fluid for the purpose. Use a perfectly clean pen, and, after writing, go over the letters with a smooth paper-cutter to remove all traces of the salt. Exposure to the heat of a bright coal fire turns the writing black.

SOLUBLE GLASS.—Soluble glass can be made of pure sand fifteen parts, charcoal one part, and purified potash ten parts. Mix, and heat in a fireproof melting-pot for five hours, or until the whole fuses uniformly. Take out the melted mass, and, when cold, powder it and dissolve it in boiling water.

PORTABLE MUCILAGE.—To make pocket mucilage, boil one pound of the best white glue, and strain very clear

boil also four ounces of isinglass, and mix the two together; place them in a water bath (glue kettle) with half a pound of white sugar, and evaporate till the liquid is quite thick, when it is to be poured into moulds, dried, and cut into pieces of convenient size. This immediately dissolves in water, and fastens paper very firmly.

REMOVING INK STAINS.—A solution of chloride of lime in water to which a little acetic acid has been added is among the many receipts recommended to remove ink stains from linen.

STAINING MARBLE.—Marble can be stained different colours by the following substances:—Blue, solution of litmus; green, wax coloured with verdigris; yellow, tincture of gamboge or turmeric; red, tincture of alkanet or dragon's blood; crimson, alkanet in turpentine; flesh, wax tinged with turpentine; brown, tincture of logwood; gold, equal parts of verdigris, sal ammoniac, and sulphate of zinc in fine powder.

MOUNTING MICROSCOPIC OBJECTS.—A mounting fluid for microscopic objects is made of gelatine one ounce, honey five ounces, distilled water five ounces, rectified spirit half an ounce, and creosote six drops. Filter through fine flannel. Heat the honey before adding to the gelatine, which last must be dissolved in the boiling water. When cool, add the creosote.

SIMPLE MODE OF ENGRAVING.—Copies of signatures, which may be printed from on a copperplate press, can be made by writing the words and then sprinkling the wet ink with very finely pulverized gum-arabic. Make a rim of dough, putty, or similar material, about the writing, and pour in melted fusible alloy of five parts bismuth, three lead, and two tin. This alloy melts at 199° Fah.

WATERPROOF GLUE.—Boil eight parts of common glue with about thirty parts of water, until a strong solution is obtained; add four and a half parts of boiled linseed oil, and let the mixture boil two or three minutes, stirring it constantly. (In these directions, parts by weight are to be taken).

WATERPROOF CEMENT FOR CAST IRON PIPES, ETC.—Take equal weights, in dry powder, of burnt lime, Roman cement, pipe-clay, and loam, and knead the whole with about one-sixth the weight of linseed oil. The addition of more Roman cement improves the quality.

CEMENT WHICH RESISTS MOISTURE AND HEAT, BUT NOT THE DIRECT APPLICATION OF FIRE, FOR GAS AND STEAM PIPES AND SIMILAR PURPOSES.—Two parts of red lead, five parts of white lead, four parts of pipe-clay; fine and dry, and work the whole into a stiff mass with boiled linseed oil.

RUST CEMENT FOR WATER AND STEAM PIPES, STEAM BOILERS, ETC.—Make a stiff paste with two parts sal-ammoniac, thirty-five parts iron borings, one part sulphur and water, and drive it into the joint with a chisel; or, to two parts of sal-ammoniac and one part flowers of sulphur, add sixty parts of iron chips, and mix the whole with water to which one-sixth part vinegar or a little sulphuric acid is added. Another cement is made by mixing one hundred parts of bright iron filings or fine chips or borings with one part powdered sal ammoniac, and moistening with urine; when thus prepared, force it into the joint. It will prove serviceable under the action of fire.

STOVE CEMENT, FOR THE JOINTS OF IRON STOVES.—Mica, together with finely sifted wood ashes, an equal quantity of finely powdered clay, and a little salt. When required for use, add enough water to make a stiff paste.

IRON CEMENT WHICH IS UNAFFECTED BY RED HEAT.—Four parts iron filings, two parts clay, one part fragment of a Hessian crucible; reduce to the size of rape seed and mix together, working the whole into a stiff paste with a saturated solution of salt. A piece of fire brick can be used instead of the Hessian crucible.

CEMENT FOR FASTENING WOOD TO STONE.—Melt together four parts pitch and one part wax, and add four parts brick-dust or chalk. It is to be warmed, for use, and applied thinly to the surfaces to be joined.

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EXPERIMENTAL COMMITTEES IN PHOTOGRAPHY.

A POINT of some interest arose in course of the discussion of Colonel Wortley's paper at the Photographic Society on Tuesday evening last. In referring to the uncertainty of many modes of estimating varying rapidities, Col. Wortley suggested the importance of appointing committees of competent gentlemen, whose report, after adequate trial of suggested novelties, would be of much value to the photographic community at large, who were often bewildered by the various processes and modifications proposed in different quarters, any attempt to test the whole of which would be a hopeless task for photographers generally.

The suggestion met, however, with less favour than might at first glance have been anticipated. It was not much discussed; but after definite condemnation from Mr. Hughes, and hesitated disfavour from the Chairman, it found no champion or advocate except Colonel Wortley himself. Mr. Hughes remarked that the appointment of committees to investigate various subjects seemed to be a common practice in some foreign societies; but he could not call to mind the reports of any such committees, or any advantage arising out of them. The history of two committees appointed by that Society would be familiar to the minds of many. One was a committee to inquire into the causes of fading in silver prints; but after all its protracted and careful labours he scarcely thought that any increased permanency in prints had been secured. The other committee was the well remembered collodion committee, and he did not think that any one had heard of any good which arose out of its labours. The duties of such committees, if properly performed, would be onerous and thankless, and the results, he thought, of doubtful value.

That a careful and efficient performance of the duties which would devolve on such committees would be a serious tax upon the time and attention of men capable of undertaking them, and that the office would be a thankless one, there cannot be a doubt; and it is in this fact rather than in the doubtful value of the reports of such committees the chief difficulty in securing their establishment lies. It is true that the celebrated, or notorious, collodion committee was in every way a lamentable mistake. Established at a time when little was known as to the sources of excellence in collodion, it should have been prepared to examine every collodion, details of the preparation of which were submitted to it. As a practical fact it examined the collodion of one manufacturer only, and, without comparison with others, pronounced this the best. The labours of this committee cost the Society, if we remember aright, upwards of one hundred pounds. Collodion was supplied *ad libitum* to the members for examination and testing, and gallons of it, we have been

assured, were in existence years afterwards, in use for cleaning glass plates. The whole purpose and the action of the committees constituted one huge blunder; and its history would probably serve as a beacon, indicating what to avoid in the formation and action of future committees. In the printing committee we think Mr. Hughes was less fortunate in his illustration of inutility. If the immediate results in the shape of absolute permanency in silver prints were not as marked as might have been desired, it may be safely affirmed that the photographic community at large knew much more of the immediate causes of fading after the publication of the report of that committee than had been known before, and it is not too much to believe that a largely increased tenure of existence, if not absolute permanency, has been given to hundreds of thousands of prints by the information diffused in that report. It is a long time since it was published, and much experience in photography has been gained since that day. It is not improbable that another committee appointed for the same purpose, and conducting its operations with the same care, would arrive at results of great interest and value to the community.

Colonel Wortley, replying to the objections of Mr. Hughes, said that the difficulty of dealing with such extended subjects as permanency in photography must be admitted; but his suggestion was of a much simpler nature. Some one suggests, in the journals or the Society, that an addition of a certain kind—say, of nitrate of uranium—to the negative bath would secure a definitely increased ratio of sensitiveness. Three capable gentlemen appointed by the Society could decide the question by a couple of hours' experiment, and their dictum would be invaluable in settling the perplexities of the photographer who was bewildered by the multitude of suggestions which appeared from time to time. Probably no proposition could more admirably harmonize with the wishes and wants of a large portion of the photographic community than that of Colonel Wortley. What could possibly be more desirable than that every improvement in photography, every suggestion for increased sensitiveness in the plates, for greater excellence in result, or for greater advantage of every kind, should reach the non-experimental worker with credentials as to its precise claim and degree of trustworthiness, which should enable him to determine without test or trial whether it would meet his individual requirements? Occasionally he would no doubt think it was very good of the capable men in London who sacrificed their time and ability for his benefit. Occasionally, too, others would come to the conclusion that the reports were not very trustworthy, after all; that the members had some personal purpose to serve; that they were "a clique," or a "ring," who in some occult and inconceivable manner served their own ends by devoting their energies to the public service in connection with the art they loved. That experimental committees could be of incalculable service in many respects we think might easily be demonstrated; whether it would be wise or desirable to institute them for the purpose of establishing points which most energetic and capable photographers may easily settle for themselves, and which all desiring the advantages of the investigations published from week to week in the journals should be willing to test for themselves, is a question. The point out of which the discussion arose—namely, a suggestion for a committee to test a point which Col. Wortley mentioned in his paper, the advantages to be gained by the addition of nitrate of uranium to the negative bath—was one on which the report of a committee would, doubtless, be interesting; but is, at the same time, one which presents very little difficulty for verification to the intelligent photographer in his everyday practice. Col. Wortley, who, in connection with the Wothlytype process, and in connection with his own emulsion process, has experimented extensively with ura-

nium, finds that its addition to the silver bath for negatives gives increased sensitiveness. Capt. Abney has published in our pages details of similar experience. The suggestion is one which every photographer may test, and come to some conclusion as to its value to himself in his daily practice, better than a committee undertaking careful photo-metrical experiments, for reasons into which we need not enter here.

Nevertheless, there are various questions in connection with the art which competent committees could alone deal with efficiently, and which, if such committees could be formed and induced to work, the art and its devotees might be greatly benefitted. As photography gradually becomes an industry or trade, rather than a new science presenting problems to students, and a new art offering delights to amateurs, we fear that the formation of committees of able men devoting energy and time, without any reward but the appreciation of their fellows, and with all the risks of obloquy, will become more difficult to secure; nevertheless, we should be very unwilling to check or discourage the slightest chance of securing such aid for settling a few of the still unsettled vital questions in the art.

M. GEYMET ON PHOTO-ENAMELLING.

At the last meeting of the French Photographic Society M. Geymet called attention to his method of enamelling, and gave some further details on the subject. The sensitive liquid he employs for coating the plate upon which the image is produced is made up of—

Water...	...	...	1 litre
Glucose...	...	...	50 grammes
Honey...	...	...	5 "
Powdered gum...	...	...	50 "
Saturated solution of bichromate of ammonia...	...	...	200 cub. cents.

No very great skill is required to pour this sensitive mixture upon a glass plate. The film is dried, and is then exposed for two minutes in the shade, the image being afterwards developed by means of enamel powder passed over it with a brush. This operation should be repeated two or three times, leaving an interval of two or three minutes between each manipulation.

The image thus secured is covered with a film of collodion containing 1½ per cent. of pyroxyline, and when the pellicle has been formed, the plate is plunged into a bath of acidulated water which contains 10 per cent. of hydrochloric acid. The plate is withdrawn from the first bath with some precaution, for the pellicle will be found to be already detached from the glass, and the film is transferred to another water bath to remove every trace of acid. After a few minutes' sojourn in this second water, the image is lifted by means of the plate, and placed in a sugar solution—

Water...	...	100 cubic centimetres
Sugar...	...	25 grammes

The enamel plate, cleaned with borax, is then pushed under the pellicle, and the print is upon its definite support. The plate is put upon filter paper, which absorbs the excess of sugar solution. The enamel is covered with tissue paper, and it is pressed, softly in the first instance, with a tuft of cotton-wool. Afterwards more pressure is used, the tissue paper being changed and the enamel being dried. It is then placed, while yet warm, in a saucer of sulphuric acid without water, to destroy the collodion, which happens after half an hour. Nothing now remains but to rinse the enamel plate in two or three waters, and when dry it is burnt in a muffle furnace, heated to a cherry-red temperature. Any retouching that is necessary is done, and the lights are heightened by touching them with dilute hydrofluoric acid, and afterwards the enamel is put into the muffle again to get a final glaze. Any

colouring that may be necessary is applied by means of a brush, taking care that the tints on the face and hands must be applied at the very last. Flesh-coloured tints must be burnt in with a very moderate heat.

HOW TO PRODUCE PHOTOGRAPHIC PORTRAITS WITHOUT A CAMERA.

A HUMOROUS sketch of a Chinese studio is given by M. C. Kardactz, who was one of the gentlemen attached to the transit of Venus staff that proceeded to the seaport of Tschifu to make observations in the neighbourhood. The Chinese officials, our German collaborateur tells us, marvelled much over the solar instruments that were imported to take the necessary astronomical observations, and their use was explained through an interpreter. An image of the sun was secured and handed over to the chief dignitary, who was exceedingly delighted with this *souvenir* presented to him.

M. Kardactz was asked anxiously if he could photograph things on the earth as well as in the sky, and this he proved by taking a group of the officials then and there assembled, with which the Chinese dignitary was highly delighted. He thanked M. Kardactz a thousand times, and gave him a pressing invitation to come into the interior to see his estate and to depict any objects he desired in the neighbourhood. M. Kardactz gave no decided answer to this polite invitation except that he would consider of it.

The reason for all this ceremony towards the photographer of the party would appear to be the fact that he brings the first camera that has yet been seen at Tschifu, which is, by the way, not an unknown spot, but the most fashionable watering place among the Southern Chinese. The doings, therefore, of our brother in the art were looked upon as miracles, and no wonder his footsteps were dogged and his movements watched wherever he went. Nevertheless, it turned out there was a photographic studio at Tschifu, and one, too, at which a good deal of business was conducted. You could go in at any hour of the day, providing you were a Chinaman, and get a portrait executed in a very short time. This Chinese artist, somehow, did not appear to have much affection for the newly-arrived representative of the art, however, for instead of affording a welcome in any way, he seems to have studiously avoided a meeting. His studio was considered a sort of tell-your-fortune abode, and, so it came out, did not even contain so much as a camera or a lens. The northern Chinese had merely acquired a large collection of portrait negatives, and when a customer came, he took his measure mentally, looked through the stock, and chose the picture most like. As all Chinese heads are pretty similar, and their pigtails much about the same length, it was never difficult, apparently, to make a match, for the public were quite content with what they got for their money. The photographer seemed to thrive, for the good people of Tschifu were never tired of having their portraits taken, and, as everybody was satisfied, there was no reason why matters should be changed, although it is M. Kardactz's opinion that if a Shanghai photographer were to pay the place a visit during the bathing season he would run the heathen Chinese very hard, and, no doubt, make a lot of money.

FRENCH CORRESPONDENCE.

BLANCHARD'S ENLARGING PROCESS—NICEPHORE NIEPCE AND EARLY PHOTO-ENGRAVINGS—PHOTOMETER—COLOURED SCREENS IN LENSES—EBURNE PAPER—PHOTO-MICROGRAPHS—THE PARIS SALON FOR 1875.

In reference to the process of enlargement communicated to the Photographic Society of Great Britain by Mr. Valentine Blanchard (a process which much resembles

that made known by Mr. Wharton Simpson in the *YEAR-BOOK* for 1872), M. Valette, a Paris photographer, informs me that for several years past he has used an analogous method, but with a very advantageous modification. He is able, by the plan he adopts, to retouch the transparent positive, which serves to secure the enlarged negative, and to change in an important manner the image to be reproduced in a very simple way. He simply stretches behind the positive cliché a sheet of vegetable paper, upon which the changes and additions are effected that may seem desirable, after he has scratched away by means of a point or eraser any spots or blemishes he desires to remove. This is a dodge which, without being very new, will be of much practical value to operators.

At the monthly meeting of the French Photographic Society, which took place on Friday last, a curious document was exhibited by one of the members. It was one of the first engravings produced by Nicéphore Niépce. This sketch, which brings to mind the early essays of our art, dates from the period between the years 1829 and 1833—that is, during the time of the partnership between Niépce and Daguerre, which was terminated by the death of the first-named partner. There is no need to remind my readers that the first experiments of Nicéphore Niépce were made in the direction of photo-engraving, having for their object the etching of the image traced by light upon the metal plates covered with bitumen of Judæa. The subjects chosen by the illustrious inventor were stamps, or old engravings of a simple character.

M. Franck de Villecholle presented through M. Davanne a photometer of the Autotype Company of London. The readers of the *PHOTOGRAPHIC NEWS* certainly know all about this little instrument, so that I need only mention the favourable manner in which it was received.

It is well known that for some years past the interposition of coloured glasses between the sensitive plate and the object to be reproduced has often been employed with success. An optician, M. Berthiot, has conceived the idea of constructing lenses with the interposition of parallel glasses of a blue colour, and he exhibited one of these instruments before the members of the Photographic Society last Friday. It appears that it is not a matter of indifference where the coloured glass is placed, and after a number of ingenious experiments he has found that the same should be fitted between the two lenses, quite close to that which forms the anterior face of the combination. M. Davanne, who has tried a lens of this character, did not find that it had a more rapid action than those of ordinary construction, but it gave most harmonious pictures even when the objects taken offered very great contrasts. M. Leon Vidal, who was present at the meeting, observed that in many cases it would be well to change the colour of the glass interposed between the lenses, and he suggested the mounting of glasses in such a way that they might be slipped in or out at will, as is the case with diaphragms.

M. Berthoit also exhibited a lens with a multiple focus, the novelty of which consists in the mounting of different lenses. The *ensemble* occupies a very small space, and forms a suitable pocket instrument.

M. Ribera has forwarded a numerous collection of specimens of a new matt paper, which possesses the advantages of being very economical, and preserving intact its whiteness; it is capable of giving very fine impressions, as is proved by the beautiful pictures that accompany the communication he sends. The sensitizing of the Eburne paper, as it is called, takes place upon a six per cent. silver solution only, and there is the advantage that the bath never becomes discoloured. The image, being upon the surface, is easily retouched. The sensitizing bath is composed according to the American formula, which consists in adding nitrate of ammonia to the silver solution. The nitrate of ammonia is prepared by satu-

rating ammonia with pure nitric acid, or, in other words, by mixing the two materials in equal parts. According to the quantity of nitrate of silver taken, half the same measure of this mixture is added; thus, to make up a litre, thirty cubic centimetres of the mixture are taken, and to this are added six or seven hundred grammes of water, and in the rest of the water are dissolved sixty grammes of nitrate of silver. The whole is mixed, and then filtered. A slight addition of alcohol or of sugar is useful; it is well also to have the bath slightly acidified with nitric acid. To maintain the bath in its proper condition, which is of course necessary, it is well to have a separate bath of 6½ per cent. strength, for instance, and every time the solution is used, the quantity exhausted is made up from this stock bath, so that the solution always remains at its proper strength. The paper, upon which, as we have seen, very fine translucent prints may be obtained by means of the wax or varnish applied after fixing, appears to be exceedingly useful for enlargements.

M. Aime Girard made at the end of the meeting a very interesting communication respecting the production of micro-photographs, which he employs as enlargements in his lectures at the *Conservatoire des Arts et Metiers*. He executed before the members present the whole operation of enlarging the image in the camera, and the projection of the image upon a screen. M. Girard laid stress on the point that he did not make use of any novelty, but that he simply utilized the processes already known, and made use of them for his benefit. Thus he employs an oxyhydrogen lamp from an ordinary vertical microscope, and a camera of short focus fitted to a microscope by a tube furnished with a plane mirror inclined at an angle of 45 degrees. As a matter of course, the whole of the apparatus is properly fitted together. The focussing is easily effected by moving the ground glass to and fro, so that the grain cannot interfere with the detail of the picture. A micro-photograph was taken before the members upon wet collodion with a pose of ten seconds only. The sensitizing and development took place through the medium of yellow light of a gas jet burning with a fragment of chloride of sodium.

After having terminated the complete operation of printing upon glass a microscopic image, M. Girard exhibited to the members a whole series of photographs of the same kind enlarged upon a screen, employing for the purpose the apparatus of M. Moldein. In this way he was able to show the members a means of recognising adulterated flour, and to follow into all its details the fabrication of paper, winding up finally with an exhibition of the minute structure of several plants. No auxiliary is so powerful for seconding scientific instruction as the art of photography. M. Aime Girard has proved this once more by indicating to his colleagues of the French Photographic Society the importance of these pictures, which photography has taken a large share in obtaining, and which are better than the most skilful draughtsman could furnish.

To complete the account of this interesting meeting, I must mention that M. Rousselon, who reproduces every year for the firm of Goupil and Co. the paintings shown by artists at the Salon, exhibited a further series of prints illustrative of the recent progress he has made in the art of heliography. The opening of the Salon for 1875 has given M. Rousselon a large amount of work, and he has lately produced some interesting clichés. It is to be hoped that, instead of printing them by the ordinary method, he will employ the process now in his possession, to prepare permanent albums, which, by reason of their artistic and historical value, will be hereafter of great importance. Durable photographs of this kind would gain admission at once to all libraries, from which silver prints are at present excluded by reason of their uncertain permanency.

ERNEST LACAN.

THE ACTION OF HYDROGEN UPON NITRATE OF SILVER.

In a recent number of the *Comptes Rendus* appears an account of some experiments recently undertaken by M. Békétoff upon the action of pure hydrogen on nitrate of silver solution. He has proved that this action is a substantial one, but slow in its progress. His experiments have continued above four months. He placed the silver solution in contact with the pure hydrogen in a sealed tube enveloped in several sheets of paper, and placed in a horizontal position in a dark locality.

M. Békétoff sums up the conclusions that his experiments have led him to as follows:—

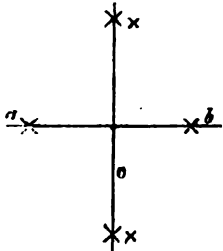
"I think I may conclude from my experiments that pure hydrogen reduces silver in the manner of other metals, in neutral or feebly acid solutions. The difference between my results and those obtained by M. Pellet seems to me capable of explanation either from the short duration of his experiments compared to mine, or on account of the solutions of silver that he made use of being too acid. As it is probable that the reducing action of the hydrogen is limited, and stops altogether when the liquid has attained a certain degree of acidity, I propose to clear up this lost question in a further investigation."

The issue of M. Békétoff's further experiments will be looked forward to with interest by photographers, for the subject is one that may possibly be of practical importance to them. If hydrogen can be made use of in photographic operations for reducing the time of exposure of the plate in the camera, there is no reason why it should not be employed as an accelerative in some instances. So far back as the beginning of this century, experiments were made with the gases in the camera to facilitate photographic action, Nicéphore Niepce working for some time in this direction.

Correspondence.

TO MAKE OVALS.

SIR,—One small but important omission has been made in your short article quoting from *Scientific American*, "To make Ovals of any Size," and that is how to determine exactly the method of using the string to give a definite size. It is this: draw a couple of crossed lines truly square,



now mark half the width of the oval wanted at *a* and *b*, next measure half the length of the oval wanted from these points to a point on the line *c*, as at *x x* these two points are the foci of the oval wanted. A very useful way to catch the string is to cut a circular notch about one-eighth of an inch from the point of a lead pencil. This prevents the thread from varying its position.—I am, yours,

W. H. DAVIES.

DEVONSHIRE SCENERY.

SIR,—Westward Ho! is an euphonious name, and there are but few authors who have lived to see their works give a name and a township to a locality. Those who have read Canoa Kingsley's work "Westward Ho!" know what a charm he has thrown around the immediate locality of

which I am writing. Almost every spot of interest he has invested with a living reality that few who have read it but long to visit those scenes so vividly depicted. Your correspondent should drop that work in his travelling case, and read it when he has time, and I can assure him many of his photographs in this district would be doubly enhanced. Whether that photograph should be the long bridge of Bideford spanning the Torridge, a scene depicted near the Bloody Corner of Appledore, the "House of the Seven Gables" at Northam, a picture of the romantic fishing village of Clovelly, or by the weird granite rocks of Lundy Island—all are clothed by Kingsley with a living lustre that makes one regret that a good deal of the work is fiction.

I will suppose your correspondent to take Westward Ho! as his starting point on his photographic tour. If his means are somewhat limited, he may lodge cheaply at the village of Northam, which is about half a mile from the above place. Here there is a very fine tower and church worth photographing, both the interior and exterior. In the yard he will see many a headstone erected by the kindly hands of the villagers to the memory of many a stranger who has been cast by shipwreck on the sands of Northam Burrows. He may also get one or two good pictures from Bone Hill looking towards the Bay. This spot is close by the church, and therefore there would be no trouble. He may then run up and take a photograph of the "House of the Seven Gables." Although it retains the historic interest with which Kingsley has invested it as the residence of his principal hero, yet I must confess it has lost much of its charm by being modernized a few years ago by its present or late owner. Though it retains something of its ancient form, yet its old quaintness is gone.

Westward Ho! as a watering-place may be commended, moreover, for its breezy openness, its quietness and repose, its extensive sands, its golf links, and its zig-zag walks on the gorse hills, on the slopes of which are built its terraces. I consider about a dozen different negatives may fairly represent the most interesting of its scenery, and its natural objects of curiosity. There is its wonderful "Pebble Ridge," extending along the beach, terminating with a range of sand hills; its like as a geological puzzle is unknown, although something of the kind is seen at Portland. Yet, for size of pebbles—more like boulders than anything else—it is unapproached. In many places the Ridge extends towards the sea to a depth of near forty feet. Yet sometimes, at a high spring, and in a N.W. gale, the sea leaps over this natural barrier. Two or three good negatives may fairly represent this object. They should be taken late in the day, so as to get the cast shadows on the land side.

Two or three negatives should be taken of the "Raised Beach." These become interesting to geologists. Two or three general views from the Pier and the Ridge will also be interesting; these will be better to be taken late in the day, as the sunlight is then streaming across the gorse hills, lighting up the deep green and golden yellow (scented) but non-actinic masses of flowers. Several negatives can be taken in various picturesque spots from the hills above, and the slopes, which are a fine extensive range.

For cloud effects and "seascapes" no place is finer than Westward Ho! Here the breakers come up full and unchecked from the Atlantic, and, with the strong actinic power of light, instantaneous pictures can generally be taken in fair weather. Clouds can at any time be taken. I use a wide-angle Dallmeyer landscape lens, and can secure clouds at any time without trouble. If the sun is staring on the lens it is a good plan to use an umbrella to shade it; in fact, it is an article I always take when working out of doors.

From Westward Ho! we will trudge along the cliffs to Peppercombe, Bucks Mills, and then to Clovelly. Each has some exquisite bits of rock scenery worth a plate or two; in fact, the former has not been done.—I remain sir, yours respectfully.

THOS. TEDRAKE.

Bideford May 11th.

SIR,—I notice that in your last week's issue a correspondent enquires where he may most profitably pitch his tent for scenery in this county.

Now, I think, nearly all acquainted with Devon will say you must go to certain places for certain scenery. But to generalise as much as possible, I would suggest Ilfracombe or an adjoining village for bold coast scenery. Near, on the old coach road, there are magnificent hill views; and as to soft landscapes within easy railway distance, I think anything might be found.

In another district there are Okehampton and Ledford; the latter is noted for a beautiful valley and Waterfall.

Now I want a little help myself. What is the best manner to produce skin-like texture on the face, &c., of a photo., after the style, for instance, of the "Alsace Lorraine" pictures, or of the Prince of Wales by the Chichester photographers.—Yours truly? E. T. ROLLS.

Alma Cottage, Lympstone, Devon, May 7.

WHAT TO DO WITH RESIDUES.

DEAR SIR,—Your correspondent "Ashes" may have been cheated in the return given for his residues, as a good opportunity offers to those not conducting their business in a fair manner to do so; but let us be charitable, as it is just probable that your correspondent's mode of precipitation would be found a source of much trouble, and uncertain, even wasteful, results in unskilful hands or by careless treatment. My own experience of refiners is (and I only deal with well-known respectable houses) that they give a very fair return for the waste entrusted to them, and my mode of treating wastes is at the service of "Ashes."

I precipitate from hypo solutions by a saturated solution of sulphuret of potash; collect the black precipitate; wash it well; and when sending it to the refiners append a caution that it contains a little sulphur, and is likely to be inflammable.

If "Ashes" has a furnace and would like to smelt it himself, he should add bicarb. of soda, grind all together in a mortar, and melt with a small piece of borax.

The plain silver washings may be treated to salt, the resulting precipitate placed in a porcelain capsule, and caustic potash added until the whole mass acquires a black colour. Dry, and the black oxide is ready for the furnace with the addition as for the sulphide and a small portion of nitre. The treatment for the paper ashes is very simple, as it only requires a little bicarb. of soda mixed with it, and may then be readily melted down to the metallic state by placing it in a crucible, and adding a small piece of borax and a little nitre. A scrap of brown soap might also be added.

I think he will find that by attending to these very simple directions he will experience no future difficulty.—I am, dear sir, yours faithfully, D. K. GRIFFITHS.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The usual monthly meeting of this Society was held in the Conduit Street Gallery on the evening of Tuesday, May 11th, Mr. J. GLAISHER, F.R.S., in the chair. The minutes of a previous meeting having been read and confirmed, Sir George Prescott, Bart., was elected a member of the Society.

The PRESIDENT then informed the meeting that Mr. Edwin Cocking had been unanimously elected by the Council as Assistant Secretary.

The SECRETARY read a paper by Col. Stuart Wortley on the subject of "Comparative Rapidities," which will appear in our next.

The CHAIRMAN, referring to a suggestion in the paper as to appointing a committee for the purpose of making certain investigations on the subject, said it was not made to the President and Council, but to the Society or meeting; and the meeting must deal with it if they thought fit.

Mr. SPILLER, referring to the alleged fact that the addition of urate of uranium to the bath gave increased sensitiveness,

remarked that from its yellow colour it might have been supposed to possess a retarding quality, and asked if the increased rapidity were due to its fluorescent qualities.

Mr. FRISWELL (the Hon. Secretary) remarked that, being one of the most fluorescent bodies, it might possibly accelerate in virtue of that quality.

Mr. HUGHES said that the idea of establishing testing committees had more than once been mentioned lately. On the Continent they seemed very fond of the practice. We often heard of committees being formed for this, that, and the other, but he must say he did not so often hear of any results arising out of their action. No doubt the reports of such committees would be very interesting if they were published; but they might not amount to much, after all. He remembered two committees formed by this Society: one was the Printing Committee, who, after much experiment, reported; but photographic prints were, unfortunately, not much more stable after the report than they were before. Then there was the celebrated Collodion Committee; and whether photographers were much wiser or not after its labours he would not say. Who in this day would willingly go through the amount of trouble involved in such committees it would be difficult to say. If the committees were formed, they would get little thanks. The proposer of any novelty would, of course, not thank them for an adverse verdict, and photographers at large would probably not thank them either way. He himself and a few others recently met on a committee they were invited to form. They had made no report, and were not likely to do so; but he thought probably each one of them had made a resolve not to be caught on a similar committee again. The idea of such committees was doubtless an attractive one, but he doubted, after all, its desirability, as well as its practicability. In conclusion, referring to the alleged accelerating qualities of nitrate of uranium, he asked if there were any chance of an iodide of uranium being formed by its addition.

Mr. SPILLER said he thought not. Chloride of uranium was very soluble, and he believed the iodide was also.

Mr. W. NOEL HARTLEY said the iodide was still more soluble than the chloride.

Mr. FRISWELL asked if Col. Wortley made any photometric examinations of the flame of his gas burner, as it would vary much during the day. Between the hours of eight and ten at night were specified by the Act as the period when the gas should possess a certain standard of illuminating power, and at all other times it was uncertain.

Col. WORTLEY always commenced his measurements by such an examination, using Wheatstone's photometer. In relation to Mr. Hughes's objections, the committees he proposed were of a simpler character, and to deal with different matters to those referred to as failures. The subjects they undertook were complicated and difficult; but if A. B. affirmed that the addition of nitrate of uranium to the bath gave a certain specific increase of sensitiveness, a committee of three capable photographers appointed by that Society could determine the question in a couple of hours; and their Aye or Nay would be gladly accepted by photographers, who would be saved the perplexity necessarily involved in the multitude of novelties, without such test or guarantee, appearing in the journals. With regard to the value of uranium in the bath, to which Captain Abney had already testified as well as himself, he hoped at some future time to give details.

The CHAIRMAN did not see that a committee could satisfactorily determine the point, as it would be very difficult to get a standard burner, owing to the varying pressure of gas.

A vote of thanks to Col. Wortley was then passed.

The CHAIRMAN announced that an exhibition would be held in the Pall Mall Gallery, to be open during the months of October and November. He also read a circular calling attention to the Rejlander Memorial Fund.

It was announced that at the next meeting Mr. Hooper would read a paper on the advantage of sulphocyanide of ammonium as a fixing agent. The proceedings then terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The seventh ordinary meeting of the session was held in 5, St. Andrew Square, on Wednesday evening, the 5th inst., the President (Dr. THOMPSON) in the chair.

The minutes of the previous meeting were read and approved, and Mr. James Smiles was admitted an ordinary member.

Mr. Bow, C.E., one of the vice-presidents, read an interesting paper on the "Colouration of Statuary" (see page 230), and illustrated his views by a number of busts and statues, both plain and tinted.

Mr. ALEXANDER MACKAY said that he had listened with much pleasure to the reading of Mr. Bow's paper. He thought the subject one of much importance, and was decidedly of opinion that there were many cases where sculpture would be largely benefited if colour could be properly laid on marble. Anyone who would take the trouble to look at a marble bust, placed in an ordinary well-furnished room, would see that it was made to look pallid and unnatural by contrast with the coloured curtains, carpets, and furniture, and he had no doubt that by the judicious application of colour a bust in such a position would be wonderfully improved. He was much pleased with the effect produced by the tinting of some of the specimens exhibited by Mr. Bow, but thought the colour a little too violent, and believed that a much better result would be obtained by lighter shading.

Mr. Ross quite agreed with what Mr. Bow had said regarding the advantage to be derived by sculpture from proper colouring. There could be no doubt that in sculpture there had always been a felt want. He thought it was impossible that one could be reconciled to the absence of expression given by the eye. All else might be well enough, but the finest statue that ever was made had always at least the one fault of being that of one that was blind.

Mr. BASHFORD thought that the real difficulty lay in getting a suitable colour or tint for marble. Gibson's Venus was, he thought, a little too strongly tinted; but he certainly, if it was possible to do it properly, would prefer a tinted bust to one without colour, especially so far as the eyes were concerned.

Mr. W. NEILSON agreed with all that had been said regarding the ability displayed in this interesting paper; but he must still adhere to what he had formerly occasion to state, that sculpture should not be coloured. He believed the fundamental principle of fine art is "likeness in unlikeness," which involves to a certain extent a departure from nature. In accordance with this principle the portrait painter gives the colours of nature on a flat surface; and on the same principle the sculptor should give the roundness of nature without its colours. Mr. Bow does not violate this principle when he says that certain busts or statues would have their expression more pronounced by the addition of shade tints. But sculpture should be sufficient in itself, without adventitious aid. The "tinted Venus" showed what colour can effect, giving a voluptuous beauty to a statue, but at the same time, destroying the principal artistic and chief charm of sculpture, viz., the sort of semi-transparent and spiritual effect that results when the human form is represented in the purity of white marble.

Mr. TURNBULL thought the effects produced by Mr. Bow very pretty, and had no doubt that, for busts that were to be kept under cover, tinting would be a very decided improvement. He, however, had a doubt as to its suitability on statues that were exposed to the weather. The question was one for the chemist to grapple with, and try to discover some means of permanently staining the marble to the required tints.

Mr. W. NEILSON said that although he did not agree with the views expounded by Mr. Bow, he thought that much benefit would result from his and such like papers coming before the Society. Hitherto photographers had given far too much attention to chemicals and cash, and too little to matters at least equally important, and he was certain that if they would give more attention to art they would be both better men and better photographers. He moved a hearty vote of thanks to Mr. Bow for his remarkably interesting and suggestive paper, which was unanimously adopted.

The CHAIRMAN then read the following question that had been found in the box:—"What is the cause of and cure for streaks in the backgrounds of wet collodion negatives?" which elicited a somewhat lengthy and interesting discussion, in course of which it appeared that the general opinion was that the streaks were caused by accumulation of ether and alcohol in the bath, or a horny and repellent sample of collodion. As a cure for the latter,

Mr. BASHFORD said that he could always with the greatest ease convert a sample of tough, horny collodion into one giving an open powdery film, or at least change one that, when poured on the glass, and allowed to partially set, and then when the finger was passed across it tore into a tough film on each side, into one that when treated in a similar way left straight lines only. The change was effected by simply giving the collodion a vigorous shaking, and then letting it settle.

Dr. JOHN NICOL was glad to hear of Mr. Bashford's discovery. If it was really so, one of the difficulties of all dry processes would be got rid of, namely, the difficulty of getting a suitable powdery cotton. He had long known that believers in homoeopathy had

much faith in shaking their medicines, but had never suspected that it would be of any use in photography. He should, however, try it, and report results.

Mr. BASHFORD assured the members that there really was no doubt about the effects of a good shaking, and said that if anyone failed to get the desired result, and would bring the sample to him, he should be glad to let them see the thing done.

The usual distribution of photographs by ballot then took place, the pictures being the gift of Mr. Alex. Nicol, and consisting of a lot of extremely fine portraits of children going to and returning from the well; for which he received a vote of thanks.

Mr. TURNY, on his entering the room, received a welcome after his six months' sojourn in America, and we understood that he has agreed to give at next meeting an account of his impressions, from a photographic point of view, of art and photography in the States.

Talk in the Studio.

SATURATED SOLUTION OF HYPOSULPHITE OF SODA.—A correspondent, Mr. G. Avery, calls our attention to a manifest inaccuracy in the "Practical Printer in America," by Mr. Hearn, in our last, in which one pound of hypo is referred to as saturating two gallons of water. This is a serious error, whether a slip of the pen or a printer's error. Hyposulphite of soda is an extremely soluble salt, one ounce of water dissolving considerably upwards of one ounce of hypo. As a rule it is wise, in preparing solutions, to take a definite weight in all cases rather than deal with the question of saturated solutions, inasmuch as the precise point of saturation will necessarily vary with temperature, and, in degree, with other conditions.

FRY v. KAMPHAUSEN.—A case of some interest to photographers was tried in the Kingston County Court last Friday. Mr. Fry, of Surbiton, sued the defendant for the value of silver cuttings and chloride of silver. Letters acknowledging the liability, and promising to pay, were put in. Defendant, who calls round on photographers and collects their residues, had called in August last, and purchased silver cuttings, &c., and promised to remit value at once. This he had not done, although often promised.—Verdict for plaintiff, and immediate payment ordered.

"IT IS FINISHED."—The London Stereoscopic Company have just published a fine photograph of a very noble piece of sculpture, by Callier, of the head of Christ at the moment of death. The head is in *alto relievo*, in a circular niche, and is singularly grand and pathetic. An admirable pictorial border, representing various scenes in the life of Christ, give especial interest to work which will be equally prized for its art excellence and its touching appeal to high religious sentiment.

"SPIRITUAL PHOTOGRAPHS" IN PARIS.—The Paris Correspondent of the *Echo* has the following:—"The Spiritualists are progressing. It appears that the mediums are not only capable of calling spirits from the vasty deep and conversing with them, but that they have now succeeded in photographing them. Such is the last discovery here, and you may probably like to know how it was made. A few weeks ago a paper devoted to the spirit-world published the following:—'M. de P—, a gentleman who had thoroughly studied the doctrines of Spiritualism, manifested the desire to obtain, by means of spiritualist photography, the portraits of his parents, and especially of a brother whom he had tenderly loved. He consulted a medium, and after two attempts succeeded in getting the portrait we offer to our readers to-day. The medium was able to give him that great satisfaction, and at the same time to prove to the incredulous world the immortality of the soul, and the possibility of direct relations between the incarnate and disincarnate.' Underneath this announcement was the photograph of M. de P—, with the image of his brother hovering over his head. The discovery seems to have 'taken,' and for some time the mysterious photograph-medium traded profitably on the folly and credulity of human nature. At length, however, he came across a heathen, who complained to the police of having been swindled out of his money, and the medium was arrested. A search was then made in the photographic *atelier*, and the mysterious 'spirits' were found to have turned into mechanical lay-figures!"

ART CULTURE IN PHOTOGRAPHY.—Referring to the sources of success in photography, the *Western Photographic News* remarks:—"Examine the record of those photographers who have made both reputation and fortune in this country and

Europe. Two almost invariable characteristics are prominent: first, that the proprietors—the ones in whose name the work goes to the public—were educated artists before they became photographers; second, in nearly all cases where success has been marked, they have been actual workers under the skylight. Let us notice a few prominent names. Adam-Salomon, of Paris—acknowledged king among photographers—is also a sculptor. Loescher and Petach, of Berlin, were one or both educated and practical artists. Luckhardt, of Vienna, was thoroughly educated in all the principles of art before he gave attention to photography. Notman, of Montreal, was originally a portrait painter, if I am correctly informed; as was also Kent, of Rochester, N.Y. And they in a few years succeeded to reputations which many others, equally capable as men, after twenty years' hard work, had failed to attain, because they lacked this art knowledge. Our Sarony, too, was a trained and practised artist for years before he entered the photographic army and stepped at once to the front. Kurtz also was an artist; and Mora, who is coming on so rapidly, was educated in the art schools of Paris. All I have named are workers with skilful hand and trained eye, putting their art knowledge to practical use, in arrangement of graceful 'pose,' artistic and effective lighting, suitable accessories, and controlling everything with intelligent purpose for perfect results." The list might easily be extended in this country by the addition of such names as those of Rejlander, Robinson, Faulkner, Bedford, Mudd, and a host of others.

PADDY'S PORTRAIT.—A correspondent at Redcar sends us the following:—

Dear Kitty, by this you will see that I'm taken,
But not up for murder, or fighting, or drink;
It's up in a room on a glass that I'm taken,
And faith 'tis a very good likeness, I think.
They brought me up to a room decorated
With calico curtains and rods made of brass.
I wondered to see myself so elevated,
And to find every slate on the roof made of glass.
The gentleman axed me to be pleased to keep steady;
He clapt a could crutch to the back of my head.
I'm sure he thought I was intoxicated,
For that was to keep my head steady, he said.
He then put his head in a bag like a booman,
And told me to try and keep steady awhile.
I sat all the time like a modest young woman,
Objecting to frown, and yet fearing to smile.
Then he took direct aim with his blunderbuss at me.
I jump'd from the chair crying, "Murder! you shan't
Take my life." "Don't be frightened," said he, smiling at me;
"It is not your life, but your focus, I want."
And then he completed his grand operation
In less space of time than a minute could pass.
He held in his hand my identification;
And sure enough there was myself on the glass.

A VARNISH FROM VULCANIZED RUBBER.—The following description of a method of making a varnish from vulcanized rubber is taken from the *Moniteur Industriel Belge*. In answering questions relating to the dissolution of vulcanized caoutchouc, we have repeatedly doubted the possibility of so doing. The present process, however, seemingly includes burning out the sulphur, &c., and then dissolving the residue. If any of our readers practically test the recipe, we should be glad to learn the result. The fragments of vulcanized rubber are deposited in a deep earthenware pot, which is closed by a tightly fitting cover, and deposited on burning coals for about five minutes. During this period care must be taken not to open the vessel, as the vapour is highly inflammable. On removal, the mass is examined by pushing a wire into it to see that it is uniformly melted; and if this be the case, it is at once poured out into a large, well greased, shallow tin pan, and left to cool. When hard, it is broken into small pieces, placed in a bottle with benzole or rectified essence of turpentine, and there thoroughly shaken and stirred. The dissolution then takes place, and after a brief rest the clear liquor which forms the varnish is decanted from the impurities which settle at the bottom.—*Scientific American*.

GOLD BRONZE for furniture is a mixture of copal varnish mixed with gold-coloured bronze powder. The last is bisulphate of tin.

To Correspondents.

DIVER.—A couple of double dark slides to carry four plates will be more portable, less trouble, and, we think, less costly, than a changing box, as from the neatness and precision in the fitting of the latter it cannot be made very inexpensively. The only inexpensive alternative is an ordinary plate-box and a changing bag, in which the plates might be transferred from the box to the dark slide; but this is very inconvenient, and always involves some risk to the plates.

M. E.—It is very difficult to deal with negatives where the prints, having got soaked with rain during printing, have been suffered to dry with the paper stuck in fast contact. The adhesion is caused, of course, by the albumenized surface, which, being softened and made slightly tacky with the rain, causes it to stick fast when dry. The print cannot, of course, be saved; but by a little judicious care the negative generally may. Slightly moisten the back of the print with a sponge, or by placing a piece of moist blotting paper at its back, watching carefully when the albumenized surface is sufficiently softened to admit of its release without allowing the moisture to penetrate unnecessarily into the negative film.

ZINC.—Water kept in a zinc cistern may be used for ordinary photographic purposes; but distilled water for baths, &c., should be kept in a glass bottle. 2. Good portraits may be taken with an east light; but you will have the disadvantage, during the forenoon, of having to deal with direct sunlight.

S. CUMBERIAN.—We shall have pleasure in giving our opinion, but it must be borne in mind that every such dictum is but an opinion; it may be valuable, of course, as based on large experience, but no such decision is of an absolute and unchallengeable character.

M. L.—There is no such list in existence that we know of. An announcement in our pages would reach the majority.

C. B. R.—The "Holy Family," which is the copy of an old painting, is not, so far as we know, copyright. The other probably is; but we cannot state with certainty.

G. WILKINSON.—We remember to have seen photographs of the statue of Gattenberg in the city of Mainz, in the shop windows in that town; but we are uncertain whether any are procurable in this country. We have an impression that we have seen it in Mr. England's series of Swiss stereoscopic views; but we are not certain.

H. W.—There are several modes in which wax is used in conjunction with coloured photographs. One method, which was patented by Mr. Sarony many years ago, and the patent now expired, consisted in taking a plain paper print, coloured in the ordinary way in water colours, only making the tints unusually bright. When completed, it is saturated with pure white wax, and backed with a piece of white paper. The effect, if well done, closely resembles that of an ivory miniature. Another plan consists in taking a lightly printed delicate print, and colouring it at the back, waxing it, and then backing it with another dark print roughly but vividly coloured. We have often given details, and of course cannot repeat them very minutely here. On page 90 of our last Year-Book a method is given.

PHOTO.—We shall be glad to hear further from you. There is some slight confusion in dealing with the "furnace enamelling," as it is not, and of course could not be, applied as a treatment to paper prints.

J. BYRNE.—Thanks. We are satisfied that much comfort and convenience would be gained by using the "Rectoptron," and shall certainly have pleasure in recommending it to photographers.

JOHN GREEN.—Many thanks. Another correspondent had been good enough to suggest the additional information before we received your favour, and the letter was in print when yours reached us.

F. BAUM.—Thanks for details. We hope the event will be better than you fear.

G. AVERY.—Many thanks. We make the correction, as you see, in another column. The additional details you suggest also appear in another letter.

THOMAS SIMS.—Thanks. In our next.

ALBERT SCHREINER.—Received.

J. G. ATKINSON.—Received. Thanks. Notice in our next.

D. WINSTANLY.—Received. Thanks. In our next.

RECEIVED: The "Chemistry of Light," by Dr Hermann Vogel. Several articles in type are compelled to stand over for want of space. Several correspondents in our next.

The Photographic News, May 21, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY AND MILITARY EQUIPMENTS—PICTURE GALLERIES FOR EVERYBODY—THE HOT WEATHER.

Photography and Military Equipments.—We have on several occasions called attention to the useful application which the War Office makes of our art in securing pictures of warlike matériel, and in recording changes that take place from time to time in equipment, in ordnance, in uniform, &c. Even alterations in the conduct of military drill, in the way in which a gun is handled and a mortar trained, or a pontoon bridge built—all these things are depicted by the camera, and the pictures sent far and wide, to the Indies and to our colonies, wherever British troops are stationed, and wherever, therefore, the influence of the change would be felt. The manner in which men are to be equipped is also important enough to invoke the aid of the camera, for even non-military readers know what importance is attached to soldiers on parade being properly and uniformly dressed and accoutred. A recent instance of the ready way in which military changes in dress and uniform can be effected throughout the army in a short time has recently been exemplified. The Adjutant-General decided, not long ago, that there should be a change in the dress and equipment of the Pioneers, those stalwart, bearded men in white aprons and gauntlets, who have the appearance of Freemasons in full fg., and always are seen marching at the head of the regiment in front of the band. The way in which these men carried their picks and shovels, and saws and billhooks, was thought to be open to improvement, and consequently an edict went forth that from a certain date the equipment of these men was to be modified. The body of Pioneers of a regiment stationed near London was ordered to report themselves at the War Department Photographic Establishment at Woolwich, and here, having been satisfactorily accounted in the new style by officers appointed for the purpose, they were forthwith photographed. Each soldier was depicted from the back and front, standing properly at attention, and thus a score of pictures were taken illustrative of the new regime. To the hundred and more regiments of the British Army those photographs will now be distributed, and from a month of the order being given by the Horse Guards, every commanding officer will have in his possession a set of photographs, showing the position of every strap and buckle on each man's uniform. Within this brief period every Pioneer of the army will be dressed as accurately uniformly as if the Adjutant-General had himself superintended each individual equipment. With the corps of Pioneers, of which no two are equipped alike, from the serjeant (who is generally the carpenter) downwards, any attempt at describing the equipment in writing would necessarily be imperfect, and however elaborate the wording might be, it could never convey so good an idea as that given by a photograph. The exact place where one tool or the other is to be fitted to the waist belt, whether it is carried under the arm, or on this side or that, how the pick and shovel are to be strapped together, where the armourer is to carry his gun spikes and hammer—all details such as these, which to a non-military mind may appear of little importance, but which in the army, where much stress is laid upon uniformity and discipline, are matters of material weight, are demonstrated in a photograph in the plainest way possible. This is, therefore, a very happy way of solving a military problem.

Picture Galleries for Everybody.—We see that Holman Hunt's picture, "The Light of the World," has been purchased for the purpose of being reproduced by photography. This is, we trust, a sign that artists are becoming

fully alive to the merits of photography as a means of turning their copyright to account. In many cases it may happen that a picture will scarcely pay the expense of being engraved, while copies of it would sell very well at a moderate price; and in instances such as these the artist would no doubt make a substantial profit by having his work photographed in two or three different sizes, and producing prints by a permanent process at a reasonable rate. No one, it is true, cares about giving a guinea for a silver photograph that may fade sooner or later, but for handsome copies of pictures of a permanent character no one would grudge a fair price. Only a short time ago we referred to this subject, and mentioned the fact that already in Paris the pictures in the *Salon* (the French Royal Academy) were being photographed, and one can obtain copies of a large number of them. There is no reason why reproductions of this kind should not find a ready sale among the many hundred thousand visitors who flock to the Royal Academy, if only the copies were brought properly to the notice of the public, and by publishing (say) at five shillings, ten shillings, and twenty shillings per copy, very nearly half of the proceeds might be handed over to the artist himself. Look at the many visitors from the country and the big towns in the North, who would, after visiting the Academy, be only too glad to take home with them two or three copies of such pictures as have pleased them the most; and photographs thus purchased year after year would form a collection, the value of which need not be lightly estimated. Instead of private picture galleries being confined to a few wealthy families, we should then have the middle classes possessing their library and modest collection of pictures. The supply of such pictures would soon create an enormous demand; but, as we have just said, we must secure to the purchasers a permanent picture. There need be no interference with engravers. Such pictures as it will pay to engrave may still be reproduced in that way, and the sale of these prints would in no way be interfered with. It is the works of young and rising artists to which we refer, who would have a far better chance of making a name rapidly than the mere sale of their pictures ensures them. Again, the photographing of a production would in no way lessen its original value, as many have averred; on the contrary, if large numbers of photographs of a certain picture were asked for, the possessor of the original would be the more envied. And as to piracy from photography, this would never occur to any great extent, for to photograph a painted picture well, much skill and good apparatus are necessary, and these are not usually possessed by those who occupy themselves with unlawful pursuits.

The Hot Weather.—The change from winter to summer has been so sudden this year that one cannot help thinking that the clerk of the weather has got numbed and confused over the recent cold, and has been and left out the spring. Only the other day we were calling out for the hot water can to stand the developer on; now we are asking for ice to cool the collodion and other chemicals. The glass plate in the slide, if it is allowed to remain very long in the hot glass room, or leaning against a tree out of doors, is apt to get very warm, and then there is good-bye to a clearly-developed plate. Streaks and stains are almost unavoidable, no matter how skilfully you pour on the tepid developer, unless you are a very rapid worker indeed. A good cooling of the glass prior to development is obviously one of the best preventives against disagreeables such as these; and in the case of dry plates even, the development is rendered much more under control if the temperature of the glass is first of all lowered. Vessels with ice, containing a bit of flannel or old blanket soaked in them, which can be conveniently wrapped round any bottles of solutions to be cooled, will be found most convenient under the circumstances, the flannel preventing a too rapid thawing of the ice, while at the same time it is handy to use.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER IV.—(continued).

TREATMENT OF THE THOROUGHLY WORN-OUT BATH.

AFTER repeated partial renovations of the bath, as already described, it will, in time, from a combination of causes—as excess of alcohol and ether, of iodide and of organic matter—require a more thorough renovation. Proceed as follows:—

Pour the bath solution into one-fourth its volume of water, when it will immediately become “milky.” In this way it dissolves more iodide than by pouring even a greater amount of water into the bath solution, because the water is greatly in excess of the silver solution during the greater part of the mixing, and the bath is so greatly reduced at the outset that it cannot take up or redissolve much or any of the iodide. The bath added to the water is thoroughly filtered through two or three thicknesses of filtering paper. *Filter perfectly clear.*

It is to be borne in mind that the solution, which is now reduced to about twenty grains of silver to the ounce of water, is saturated with iodide, so that when the solution is raised in strength the percentage of iodide is reduced to the proper proportion.

Pour this clear solution into the evaporating dish, and heat it on the stove until it begins to steam. Test the solution for acid by placing in it a piece of blue litmus paper, which will turn red from the acidity of the bath. Pour in, drop by drop, a dilute solution of liquor ammonia one part to ten parts of water, stirring the solution the while that the ammonia may thoroughly mix, until the discoloured litmus paper resumes its bluish tint, but not beyond. The acid neutralized (by the ammonia) the solution still boiling grows black and muddy, and finally clears as the organic matter is precipitated, sticking to the bottom and sides of the dish, the coagulated albumen rises as a thick metallic scum to the surface, and the heat drives off the alcohol and ether.

When the solution is cold it must be filtered and acidified as already explained, with nitric acid. It must be borne in mind that *the nitric acid must not be added until the solution is perfectly cleared from organic matter by filtering*, because acid holds the organic matter in solution, while the alkaline liquids (in this case ammonia) favour precipitation. The addition of acid before filtering would undo a great part of the work of renovation you have been engaged in, by redissolving the organic matter.

When after several treatments of the disordered bath in this manner, if it fails, there remain two other methods—fusion and precipitation, and re-dissolution.

To Fuse the Bath.—Pour the bath into one-fourth its volume of water, and filter out the precipitated iodide; then, placing it in the evaporating dish on the stove, evaporate to dryness *without adding ammonia or other neutralizing agent*, because upon adding ammonia oxide of silver is thrown down, and if the bath were now evaporated to dryness, this powder, to which the name fulminating silver has been given, would be thrown down. This fulminate is of a most dangerously explosive character, even under water heated to 212° Fahr. When dry, a touch is sufficient to cause its violent decomposition.

When the solution approaches dryness it bubbles violently, and rises in the dish like soapsuds, until some of the bubbles burst, allowing the escape of vapour. Scrape the mass down into the middle of the dish, when the salt begins to liquefy again. When melted it remains quiet, without boiling or steaming, at the bottom of the dish. Insert a straw or splinter of wood, and continue the heat until it ignites, which shows that the organic matter is carbonized, and thus rendered perfectly insoluble. When cold the fused mass may be dissolved in pure water by gentle heat. The organic matter is entirely separated, and will be left behind in the filter. It is now ready for use as a new bath.

To Restore by Precipitation.—Dilute and filter out the iodide, and pour the solution into large glass jars, half filling them, and add a little at a time, and continually agitating the solution the while, finely powdered bicarbonate of soda; this, uniting with the silver with violent effervescence, forms carbonate of silver, which, being insoluble in water, falls to the bottom of the jar. Now fill up the jar with pure water. When settled, pour off the water, fill up, and when settled again pour off, thus eight or ten times, to thoroughly wash the carbonate of silver; after the last washing drain off the water, and add, very cautiously, nitric acid, which will dissolve the carbonate of silver with effervescence. Leave the least amount of carbonate of silver undissolved, or too much acid will be added, and the work have to be done again, the organic matter in the bath being dissolved if the silver is made acid. The least amount of precipitate of carbonate of silver undissolved leaves the bath neutral. Now filter the muddy solution.

To throw down Silver in a Metallic State.—Place the solution in a clean evaporating dish with pieces of bright clean zinc, when the silver will commence falling down in a metallic state, the zinc dissolving and taking the place of the silver. In a few hours the silver in the form of a grey powder will be all thrown down. Pick out the undissolved zinc, and scrape from it the silver clinging to it. Now add to the mixture a solution of sulphuric acid one part, water three parts, to dissolve any particles of zinc which may be left in the dish. Allow this to stand until no more bubbles of hydrogen gas are given off. Pour off the acid, and wash the silver in several changes of water until it no longer reddens litmus paper. The silver is now dissolved in nitric acid diluted with two parts of water, evaporated to dryness, and fused.

ON MICRO-PHOTOGRAPHY.

BY DR SCHIMANN.*

THE microscope has become an indispensable instrument to the student of natural history. The results of microscopic investigation have widely extended our knowledge of natural history, and have brought to light facts connected with the development of the lower animal kingdom of which, before, we had no anticipation. Daily the microscopic journals bring us new discoveries.

The permanence of microscopic preparations is often very limited, and yet it is very desirable that they should be preserved for scientific as well as instructional purposes. Under these circumstances it is a matter of importance to secure trustworthy images of the same; and how difficult these are to obtain by a pencil must be apparent to all. A draughtsman finds pencilling a microscopic object a most tedious labour, and very often the result is, after all, of an ideal nature; moreover, it requires one skilled both as a microscopist and draughtsman to be able to produce such drawings.

Many instruments have been constructed to lighten the laborious task; as, for instance, Wollaston's *camera lucida* for microscopic drawing, Oberhauser's drawing apparatus with prisms for projecting the picture on paper, &c; but photography has now held out a helping hand, and already, in the days of Daguerreotype, the camera was employed for making microscopic pictures.

The first presentable pictures were obtained by Douné. After that, Leon Foucault obtained some results, in 1845, which were used as a basis for the copper-plate illustrations of an atlas of fluids.

With the employment of collodion in photography, and the use of albumenized paper, micro-photography made a big stride of progress. By means of negatives, large numbers of copies could be produced, and with the Licht-druck process of the present, it is possible to publish books illustrated by micro-photographs. Professor Benecke, of Königsburg, who has translated Moitte's handbook

* Read before the Berlin Society for the Advancement of Photography.

entitled "Photography as the Aid to Microscopic Science," has shown how much may be done with the new art, although, unfortunately, it is not everybody who has such a well-adapted studio and apparatus as the author I have named. Dr. Fritsch's "Diatomaceæ" is another work showing the importance of micro-photography.

The difficulty in obtaining micro-photographs, exclusive of the various colours and the uneven thickness of the microscopical preparations, is the focus difference of microscopic lenses. Even when these can be corrected by application of other apparatus, the operation is a tedious and time-taking one.

Benecke himself says: "It would be desirable to have photographically-corrected lenses," and this wish has since been heard from others; so that I am led to bring forward an apparatus which I have employed, and some specimen prints obtained by it. The most important thing about the instrument is the corrected lens, which is screwed on the microscope tube without an eyepiece. The bellows camera is upon a brass tube, fastened to a horse-shoe pedestal, so that it can be rudely focussed by a screw arrangement, and it is brought in a vertical position over the microscope tube, an arm upon the camera being drawn over the tube to shut out the light.

The screen for focussing is a glass plate with fine diamond markings, and the farther this is from the lens the larger will the object be. In the case of big enlargements, the question of lighting is one of great importance, and the use of condensers with direct light, or limelight, is indispensable. Enlargements of twenty-two diameters may be prepared in this way.

In America, Walss has, according to Rutherford, constructed corrected lenses with one-eighth of an inch focus, by means of which Woodward has secured a picture of *Pleur-sigma Angulatum*; by enlarging to 19,000 times, a sharp image was still obtainable. Corrected lenses are also, to some extent, manufactured in Germany, MM. Siebert and Krafft, of Wetzlar, preparing them from one inch to one-eighth of an inch focus.

COLOURATION OF STATUARY.

BY ROBERT H. BOW, C.E., F.R.S.E.*

But though we may thus see that there are good grounds for eschewing any attempt to copy the actual colours at the same time with the solid forms of nature, there may be no well-founded objections to doing away with the weak points in sculpture by adopting some modification of ancient practices.

In order to the conveyance of facial expression in a forcible manner, we must define the positions of the eyes, the characteristics of the lips, and the colour-markings of the hair—whether that be of the eyelashes, eyebrows, head, or beard—in a more precise and decided manner than can result from cast and contour shadows.

Taking up a photograph or engraving of a head, we find the features and expression brought out by simple light and shade. But the shades are divisible into three kinds—1st, the contour shades, or shadowings produced by the surfaces represented being placed at various inclinations to the incident light; 2nd, the cast shadows arising from other parts of the subject directly intercepting the light; and 3rd, the colour shades representing the darkening effects of the colours of the surfaces, or their power of absorbing in various degrees the light that actually falls upon them. And, as supplementary to this classification, we must not overlook the important modifying effects of the more or less polished states of the surfaces.

In the simplest white statuary the effect rests wholly upon the contour and cast shadows, with occasionally (as in the Veiled Vestal) the employment of the contrast of polished and unpolished surfaces. Now, the purpose of my paper is

to suggest and enforce that we should superadd the third kind of shading representative of colour, but in as great moderation as may be, and by preference only using shades of grey when the whole surface has to be painted.

When the general surface of the statue, or other piece of sculpture, has not to be painted, and possesses of itself a tint different from grey, we must be guided in the choice of the two extremes of the scale of shades to be used in our dichromatic treatment by the analogy of an engraving printed in brown or other coloured ink upon tinted paper; the scale of shaded tints to be employed should be such that the natural colour of the material will take its place as one of them; and it is open, of course, to apply any such dichromatic scale, even when all the surface of the subject is to be painted or enamelled.

Restricting ourselves to the use of such a scale of shades, I believe we could attain to much excellence of effect, without in any degree awakening the disagreeable feeling that results from attempts to give life-like colour. A piece of statuary so treated would, in fact, convey all that an engraving could, with the added charms of stereoscopicity, changing points of view, and changing arrangements of the lighting.

And, as connecting the subject with this Society, I may state that a bust so shaded would be a most valuable addition to the studio of the photographer, to assist him in the practice of proper lighting. In a properly lighted figure we must not only have the cast and contour shadows becomingly arranged, but so tempered in severity as to harmonise agreeably with the positive shades. When the cast shadows are too faint, we have the eyes, eyebrows, &c., given as black marks upon a white ground; and when the cast shadows are made too decided, one or both of the eyes may be lost altogether in the gloom.

A weak point in ordinary statuary, arising from difficulties in the workmanship alone, is the absence of the eyelashes; we lose the effects both of the positive colour and of the cast shadows. This defect was well known to the ancients, and examples are still extant in which eyelashes of copper are inserted; and, to make our busts completely satisfactory, it would be necessary to follow some such practice. The defect may, however, be in a great measure supplied by a painted shading on the edges of the eyelids; the inner surfaces being at the same time shaded to represent the carmine tint there.

In thus advocating the employment of neutral tints, or simple light and shadow, to reinforce and complete the effectiveness of statuary, I do not wish it to be understood that I am altogether hostile to the greater innovations so ably advocated by Mr. Owen Jones. But I think the dichromatic treatment I have proposed might be erected into a distinct and not unimportant branch of sculptorial art. In carrying it out difficulties would no doubt arise, but we may trust to technical skill also arising to overcome these, should encouragement be given. I add only two hints here of a practical character—1st, Keep the polish or lustre of the flesh tints rather under than over that of nature; but the degrees of glossiness of all the surfaces should be studied so as to reproduce with approximate correctness the effects of regular and irregular reflection. 2nd, When the tint chosen for the nude part of the figure is lighter than in reality, let the scale of shades be all correspondingly weakened.

And now a word in conclusion on the general bearing of the subject. When we look at a complicated pattern of interlacing geometrical figures, the eye, as every one knows, can single out some particular figure and regard it separately, and again and again, new figures or parts of the combination may be so selected at will by the eye. Now there is an analogy between this and the contemplation of an unpainted bust: the eye through the fancy may regard it under all the different aspects that it would be possible to evolve by variations in the painting; and it may be brought forward as the chief objection to the painting of

* Continued from page 231.

sculpture, that this freedom of the fancy is curtailed, and the contemplation restricted to one phase of expression alone. Without denying some weight to this objection, and granting that some pieces of sculpture would be best left unpainted, it may be replied that the painting gives the artist the power of fixing the best aspect of his subject, or bringing out that expression which he seeks to convey; and in the case of a portrait bust, every one must admit that the advantages are all on the side of the use of shade-painting or enamelling.

ON THE COMPARATIVE SENSITIVENESS OF VARIOUS PHOTOGRAPHIC PROCESSES.

BY LIEUT.-COL. H. STUART WORTLEY.*

I HAVE for some considerable time past been testing experimentally the sensitiveness produced by various modifications of the photographic negative processes, both with the bath and with an emulsion. I have frequently noticed during the course of these experiments that my experience has been opposed to that of others who have recorded experiments in the same direction in the various photographic journals. Where the quality of the negative is in no degree sacrificed by increasing the sensitiveness of the materials composing the film, I have always thought that the more sensitiveness we can impart to the film the more advantage and facility do we obtain in our work; and I think that the subject on which I am writing is of such great importance that it has induced me to bring the matter before the Photographic Society. We frequently find it recorded in the journals that such and such a process has given such and such results; but there has never been an attempt to produce those results by a standard measure of illumination, and we finally arrived at the "*reductio ad absurdum*" in connection with the subject when we were gravely told (though I do not think many people remained grave when they read it) that a transparency could be printed on a certain kind of dry plate by half a second's exposure to the light of a farthing rushlight! Feeling, then, as I do, the great gain to the photographic world at large that even a slight increase of sensitiveness gives to a negative process, I venture to make the following suggestion to the president and council of the Photographic Society. I think it would be a great advantage and assistance to the photographic public if the council would appoint a small standing committee to investigate from time to time the sensitiveness of the various modifications of the photographic negative processes, wet and dry, that may be brought before them—to do which they would have to establish a standard method of illumination, and use certain standard negatives from which to print transparencies. In my own practice I use a standard Argand gas burner, at a certain distance from which a shelf is placed whereon the printing frame containing the negative and plate on which to print the transparency is laid, and the time of exposure can be regulated to a great nicety. I have used in my experimental work during the last three years one standard negative, from which I must have printed some thousands of transparencies, and I need hardly say that the information I have in that manner acquired has been of great interest and value. In cases where it has been deemed desirable to take a negative, I have endeavoured, by burning a certain amount of magnesium wire, to obtain a standard result; but I find that the printing of transparencies in the way just described gives results much more certain and more reliable.

If this committee were to be appointed, and if good men were to be found who would undertake this somewhat troublesome duty, we should find that many preconceived opinions would be ruthlessly demolished; we should find that there is no inherent virtue in gelatine over collodion for making an emulsion with, and that a properly made

collodion-emulsion is every whit as sensitive (owing to the latitude which may be allowed in exposure and development of a collodion dry plate, and which a gelatine plate is not, in reality, more capable of standing) as a gelatine emulsion; we should find that the addition of ten to fifteen grains of nitrate of uranium to the ordinary silver bath gives a considerable addition to the sensitiveness; we should find that, under certain circumstances of emulsion work, Mr. Carey Lea has been correct in pointing out the additional sensitiveness imparted to the emulsion by the use of an iodide therein; and we should find that the use of a chloride in the emulsion or in the collodion used with the bath is an element of insensitiveness, though the reverse attribute has been claimed for it by some writers who have followed in the footsteps of Mr. Carey Lea, who first proposed to introduce it into an emulsion for purposes other than to gain increased sensitiveness.

I could give you many other instances and many other results of my own work; but I feel that I should in that case be anticipating the labours of a committee that I much hope to see established; and I do not wish to prejudge cases that in all probability would be brought before them. In conclusion, I express a hope that my proposal will be favourably received by the members of the Photographic Society, and that I shall be supported in bringing my suggestion before the president and council.

THE PRACTICAL PRINTER IN AMERICA.

XXV.

MOUNTING THE PRINTS.

Of all subjects of photography, this has received the least attention. The simple process of mounting is a thing of some little mechanical skill, as I think all photographers will agree with me in saying. The making of the starch paste, if that is used, is at first a little troublesome to the beginner, as is also the glue, gum, &c., and then the placing of them on the cards, although a mere mechanical process, should be done well.

In galleries where only two or three hundred of small cards are printed in a day, surely these few, when compared to fifteen or twenty hundred, which is the daily average in some galleries during "the harvest," ought to be mounted well, indeed excellent, when we consider that all that is required to make them so is only a little care. What is the effect left upon our minds when we examine prints that are nicely printed, cut, toned, &c., and are mounted badly? Does it not strike us unfavourably? I think it does.

It is acknowledged by many photographers that the starch used in mounting is the cause of their fading; and the reason why this is so universally used is, because all photographers have learned to make it, and because they are either ignorant of its effects on the prints, or, if not ignorant, too careless or heedless to take measures to prevent the use of it. But if this mountant is really the cause of their fading, which I think is partly true (but I also think that too much blame is given to it, when careless manipulation has considerable to do with it), why is it then used?

I have mounted prints with starch, and one day, after mounting a batch of them with it, I saved a few for myself for the purpose of experimenting, and wrote on the back of the mounts such writing that would tell me at some future time why I had saved these particular prints. I experimented considerably with them, and placed them in a very dry atmosphere for a month, then directly in a very damp cellar for another month, in a dark album for a fortnight, among the samples of work in the reception-room, on a shelf in the chemical-room for a week, in the dark-room for a fortnight, where there was a strong smell of cyanuret of potassium, ether, &c., down cellar again, under strong diffused light for a fortnight, in the damp-box for a week, and in spite of all these tests I could not get the

prints to show either stains, bleaching, cockling, or fading. Verily they were tested well, and "they stood the test like a martyr."

It is said by many—and, as far as theory goes it is correct—that the starch used in mounting the prints would ferment if the prints were exposed to various degrees of temperature, such as dampness and dryness. As stated, theoretically, this is the very best reason why the prints will fade; but in practice they do not fade so quickly after all, as the above test has proved to me, for I do not doubt but that the prints were exposed to more changes as regards temperature, colour of chemicals, &c., than what comes to most prints during twenty years, and if they were to fade at all, I should think that the above would do it, and with one exception—viz., age—they have stood a greater test than, as before said, the generality of prints have ever received.

We have photographs in our family album that were taken twelve and more years ago, many in New York, Boston, and other places, and which have been through a variety of changes, such as being on the ocean for months, both in tropical as well as in the colder climates, having been in Cuba for several months, as well as in climates where, I have been told, the atmosphere is about always damp at certain periods of the year. Upon inquiring, I have been told that the photographs were not kept in the album, except at sea, but were placed on mantelpieces and around the shelves in the family sitting-room, and thus changes were thoroughly given to them; and to-day, as I am looking at them, I am told that they have neither faded, and, as I myself see, they are not stained, or the whites discoloured, from insufficient washing, &c. Surely they were made well. I am taking for granted that they were mounted with starch, as that is the universal mountant.

Now, I do not mean to say that prints never fade from the fermenting of the starch used in mounting, for I think that if they were kept for many months in damp places they might possibly fade; but this is, I really believe, very seldom the cause of their fading.

A very good way to make this paste is to first dissolve the starch in a little cold water in a suitable dipper. Now obtain some boiling water, and keep pouring a small stream of it in the dipper where the dissolved starch is (keeping the dipper on the hot stove), stirring the contents quickly all of the time. When it is thick enough, then stop the pouring in of the water, and stir well until the starch commences to boil, at which time it should immediately be removed, and your paste will be nicely made, and there will be no lumps in it; if after it is cooled you remove the upper crust, and you do not burn the starch, as beginners are apt to do the first few times they make it, neither will there be any "cobble-stones" in it.

Glue is an excellent mountant, and is used by many skilled photographers. It is made as follows:—Obtain some of the best clean light glue, and soak the whole of it in cold water over night. The next day strain off the dirt in the water, and then pour the thin glue-water back again into the dish. Dissolve the glue as it is on a hot stove or over a small jet of gas, adding hot water to it in case it is going to be too thick, which you can easily tell by stirring the contents of the glue-pot with a stick. After it is all dissolved and ready for use, strain the whole through two or three thicknesses of muslin in a clean and suitable size glue-pot. While using the glue, place it in a dish containing hot water, and the glue will be kept in a good condition for a couple of hours, and longer still if the water is kept always hot. This can be used day after day as required, by dissolving and adding more water as necessary.

If the glue is clear and light in colour it is an excellent mountant, and I prefer it to starch. Its use is complained of by some because, they say, it cockles the prints, and a little of the best white powdered sugar is added to keep it and prevent it from cockling. Two reasons of this cockling, when using either glue or starch (whichever it may be), are using it too thick, as well as too thin; and then, again, in

insufficient "rubbing down" of the prints after mounting. The small prints, as they are removed from the water, are laid in a neat pile face down. A suitable size glass, say 8 by 10, is covered with the same size piece of clean un-sized paper, which is thoroughly wetted, and when the prints in the water are thoroughly rinsed, they are laid in a perfectly even bunch on it, the different sizes to themselves. The paper laid on the glass serves to keep the prints damper than the bare glass would. Use clean paper every time you prepare to mount the prints. The prints are mounted for convenience in a wet state. The object of mounting with the starch or glue, as the case may be, is to fill up the pores, and thus bring the print in perfect contact with the card-mount, which is aided very much in the so-called process of "rubbing down."

You should apply the starch or glue to the prints quite thinly, and after laying them carefully on the mounts, lay a sheet of thick writing-paper—or, better still, some un-sized printing-paper—on it, and rub the prints, commencing at about the centre and rubbing outwards, which process will perfectly remove all air-bubbles from under their surface. Then bend backwards the mounted print, and rub the finger along the edges carefully of all the sides of it. I recommend bending in of the back of the mount because, in drying, the print draws the thick cardboard inward, and this counteracts it, and the dried prints will be flat, and can consequently be finished better. The prints should be allowed to dry spontaneously, and then they would not be so likely to cockle as they would if they were dried by the fire.

In mounting large prints, lay a print at a time on some thicknesses of clean paper and where there is no trace of starch, and after pasting, mount it on a suitable size cardboard, and rub well from the middle outwards as in the small prints, examining afterwards to see as to whether there are any air-bubbles which escaped notice, and if so, be careful to remove all of them. When applying paste to the print for the purpose of mounting, examine the surface, and if there are any hard bunches of paste, dirt, &c., even if in a small quantity, as a lump or two, remove them with the finger nail, as these places will show after they are mounted, and spoil the look of the work. Dry these large prints in a suitable size book, kept for the purpose, and under a sheet of blotting-paper, and when they have been there an hour, remove to another place of the book, under fresh and dry blotting-paper.

CHINESE OR INDIAN INK.—Although the Chinese prepare their ink from the kernel of some amygdalaceous fruit, yet, by the aid of our present chemical appliances, we are able to produce a composition in no way inferior to the best Chinese ink, by the adoption of a formula which is given in Riffault's treatise on the "Manufacture of Colours." The following is the formula:—Calcined lamp black, 100 parts; boghead shale black, in impalpable powder, 50 parts; indigo carmine, in cakes, 10 parts; carmine lake, 5 parts; gum arabic (first quality), 10 parts; purified oxgall, 20 parts; alcoholic extract of musk, 5 parts. The gum is dissolved in 50 to 60 parts of pure water, and the solution filtered through a cloth. The indigo, carmine, lake, lampblack, and shale black are incorporated with this liquor, and the whole ground upon a slab, with a muller, in the same manner as ordinary colours; but in this case the grinding takes much longer. When the paste is thoroughly homogeneous, the oxgall is gradually added, and then the alcoholic extract of musk. The more the black is ground, the finer it is. The black is then allowed to dry in the air, until it has acquired sufficient consistency to be moulded into cakes, which in their turn are still further dried in the air, out of the reach of dust. When quite firm, these cakes are compressed in bronze moulds, having appropriate designs engraved upon them. The moulded inks are then wrapped in tinfoil, with a second envelope of gilt paper. The ink which has been prepared in this manner possesses all the properties of the real Chinese article. Its grain is smooth, it flows very well, mixes perfectly with many other colours, and becomes so firmly fixed to the paper that other colours may be spread over it without washing it out. *Scientific American.*

The Photographic News.

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URANIUM AND OTHER AIDS TO INCREASED SENSITIVENESS IN THE WET PROCESS.

THERE is probably no improvement in photography which the photographic community at large would regard as a greater boon than the assured facility of increasing the sensitiveness of wet plates. Rapidity of exposure has always been the greatest desideratum after which the desires of the portraitist have gone out. For this he has taxed the optician to improve his lenses, entreated the collodion maker to give him compounds more sensitive to light, and paid premiums to process-mongers for secrets of wondrous virtue in reducing exposure; but, oddly enough, of the many simple, practical, inexpensive modes of securing this increased rapidity which have come well and worthily recommended before the community, none seem to have come into general use—none, so far as we can learn, which have been very extensively tried. The various modes of using diffused light—coloured or white—as an accelerator, the advantages of which have been avouched by men of the highest standing in the profession, are but sparingly used, we have reason to believe, even by those photographers who have tried and proved their advantages. The method of reducing exposure and improving the artistic quality of the image by exposing for a few seconds with a stop, and for a few more with the full aperture of the lens, which has been perfectly successful in securing both ends by all who have reported on the subject, is probably no more used than the various modes of utilizing diffused light for a similar purpose. Some other proposals for the same purpose have probably received even less attention. We do not pause here to speculate on possible explanations of this somewhat puzzling indifference or indisposition to try the methods in question. Possibly many causes are in operation, amongst which incredulity is not the least potent; possibly the fact that they demand a specific effort and departure from routine on the part of the photographer. The purchase of a quick lens, or of collodion of great sensitiveness, makes no special demand on the manipulator, involves no special departure from routine, and it appeals to that prevalent element in human nature which is ready to rely on the *deus ex machina* rather than on individual effort and skill. At any rate, whatever the explanation, the facts appear to be as we have stated them.

There are, at the present moment, two or three comparatively new methods of gaining greater rapidity before the public. Colonel Stuart Wortley stated at the last meeting of the Photographic Society that he had found

that the addition of from ten to fifteen grains of nitrate of uranium to the ordinary silver bath for negatives gives a considerable accession of sensitiveness. Whether this proportion of the uranium salt is intended to be added to each ounce, or to some indefinite number of ounces, was not stated. Captain Abney, who affirms a similar experience as to the gain in sensitiveness, adds, it we remember rightly, ten grains of the uranium salt to each ounce of silver solution, and we presume that the addition referred to by Col. Wortley is intended to be in similar proportion. This is a novelty which can be very easily tested by every one, and it is a method which will not involve any manipulative trouble or departure from routine. The precise nature of the accelerating action does not appear to have been ascertained, but, remembering the known photographic qualities of the nitrate of uranium, it does not appear necessary to go far to find a reason. It may possibly be too much to say that its fluorescent properties have nothing whatever to do in the case; but we do not think there is any ground for supposing that they have. In the first place, the fluorescent qualities would become almost nil—or, at least, inappreciable—in the thin film consisting of the free solution on a drained plate, or the still smaller trace left on a dry plate which had been excited in a bath containing the uranium salt; and in the next place, the known action of the nitrate of uranium is quite compatible with the experience of Captain Abney and Col. Wortley. The persalt of uranium and some other bodies when exposed to light part with oxygen, and become proto-salts, which have a reducing power; some of the interesting processes of Sir John Herschell having been based upon this reaction. If a piece of paper be coated with a solution of nitrate of silver and nitrate of uranium, without any chloride or haloid salt of silver, it will readily darken under the action of light, which with nitrate of silver alone it would fail to do, or, at least, with any force or depth. Under the action of the light the nitrate of uranium parts with oxygen, and acquires the power of reducing the nitrate of silver in contact with it. It does not seem unfair or unnatural to suppose that the same reactions are in operation in the film of collodion in which nitrate of silver and nitrate of uranium are in contact, plus the haloid salts, on which sensibility chiefly depends. Whatever may be the theoretical explanation, the fact is an important one, and one which is so easily tested that no one need remain in doubt who is interested in securing the advantages it offers.

Some months ago we published details of Dr. Van Monckhoven's proposal to reduce exposure by the use of a more energetic developer. An experimental committee of the Photographic Section of the American Institute was recently appointed to test the matter, and they report that they find that the exposure is reduced one-third by the use of this developer, twenty seconds giving the same result with this developer which could only be exposed by the ordinary developer with an exposure of thirty seconds. They also found that a similar reduction in the time of exposure might be secured by the use of a developer containing sulphate of magnesia as well as sulphate of iron. Here is the formula:—

Water	...	...	16 ounces
Sulphate of magnesia	...	2	"
Protosulphate of iron	...	2	"
Acetic acid No. 8	...	3	"

The ordinary developer used by the committee was composed of—

Water	...	...	16 ounces
Protosulphate of iron	...	1	ounce
Acetic acid No. 8	...	2	ounces.

The advantages offered by the modified developer are as easily tested as those offered by the addition of uranium to the bath. We shall hope to hear reports of the experience of some of our experimental readers on both methods.

OBITUARY—MR. CHARLES BREESE.

WE announce with much regret the death of Mr. Charles Breese, formerly of Birmingham. Most photographers are familiar with his name, and with the charming and poetic transparencies for the stereoscope which he made his special work. Mr. Breese, a gentleman of a singularly ingenious and inventive turn of mind, as illustrated in many branches of Birmingham industry, early made instantaneous photography a special study, and his work in this direction many years ago attracted the attention of royalty. Being but ill satisfied with the imperfect rendering which a paper print yielded of some scenes in nature's poetry, of which the negative contained a fairly complete register, he confined himself chiefly to the production of transparencies for the stereoscope of scenes instantaneously produced, often of a daring nature: a breaking wave, a storm at sea, a balloon in the air, a sparkling waterfall, the rising or setting sun seen through rifts of driving clouds, moonlight scenes, groups of art objects consisting all of polished silver and glass, and a variety of other subjects in which any special and unusual charm could be secured. If it presented unusual difficulties, the charm to him became greater, and he rarely failed in securing success. His mode of printing his transparencies, generally on wet collodion, and frequently from two or three negatives, was retained a secret, and the mode by which many of his results were obtained was the subject of much speculation and curiosity, which he left unsatisfied, feeling, doubtless, that the mystery in many cases increased the interest. Some years ago he devoted himself to the commercial production of his transparencies, for which he had found, as an amateur, a considerable demand. He has practically had no rivals in his special work, for whilst many have produced fine instantaneous pictures and good transparencies, Mr. Breese's work could always be distinguished in a moment by its rare delicacy and beauty in production, and the feeling of poetry, and at times of mystic beauty, which pervaded his pictures. He had been for some years in a state of declining health, and was, we understand, staying at Matlock in search of the conditions required by an invalid, where he died on Monday morning last.

THE VIENNA VOIGHTLANDER MEDALS.

It may interest our readers to know the nature of the medals offered by the Vienna Photographic Society during the course of the present and forthcoming years. Candidates must qualify by becoming members of the Society, and all communications are to be addressed to the President, Dr. E. Hornig, 3 Hauptstrasse No. 9, Vienna. The names of those competing must not be openly stated, but should be contained in a sealed envelope having a motto or device on the outside corresponding with one on the packet with the communication, negative, pictures, &c.

A gold medal of the value of one hundred and forty ducats, or one costing forty ducats together with one hundred ducats in money, for a process to increase the sensitiveness of wet negative plates. The increase of sensitiveness shall be so great as to make it possible to give only a quarter of the exposure of that usually allowed to produce a detailed picture. The increased sensitiveness shall not be obtained at the cost of vigour or harmony of the picture. The process, again, shall be such that half an hour's exposure can be given, say, in the case of an interior, and that it can be employed anywhere without difficulty. Processes which give good results without actually fulfilling the requirements will be rewarded with prizes of lesser value. Competitors must forward their communications by the 31st October, 1875.

A gold medal of the same value, &c., will be given for a dry process which shall distinguish itself for sensitiveness and trustworthiness. The conditions are to send in three

negatives of 10 by 12 measurement at least, one being a landscape, one an interior, and one a landscape with architecture, together with two prints of each, and twelve prepared plates; details of the process, as also of the chemicals used, must be given. The candidates must forward the same by 1st March, 1876.

Three silver medals will be given for:—1. A collection of twelve nature studies, taken with an aim to aid artists. 2. A collection of twelve instantaneous stereoscopic pictures. 3. For a collection of transparencies for the lantern.

Negatives and two copies to be sent of each subject, not later than the end of October, 1875.

A MODIFIED PHOTO-RELIEF PRINTING PROCESS.

A METHOD of producing photo-mechanical printing plates has recently been patented in America by Mr. L. E. Levy and D. Bachrach, the results of which are highly spoken of by the editor of *Anthony's Bulletin*. It will be seen that a gelatine image in relief is obtained in the usual manner, the modifications being chiefly in subsequent details. The gelatine relief is plunged into a solution of nitrate of silver, and, subsequently, into sulphate of iron, for the double purpose of obtaining crispness and sharpness in the gelatine image, and of rendering its surface conducting in the electrotype bath. The precise mode of printing finally employed is not stated. The following is the specification:—

First. Gelatine is dissolved in water to the consistence of a thick jelly, solid at ordinary temperatures. When required for use the solution is liquefied by heat. To this solution is added a saturated solution of bichromate of potassium or ammonium, or its equivalent in rendering the organic substance of the film sensitive to light, in quantity varying with the temperature and with the class of work required to be produced.

Second. This mixed solution is now spread upon glass plates which have been thoroughly cleaned, and poured on until a thick layer covers the glass evenly over the whole surface. The thickness of the layer depends upon the general character of the work for which it is intended; the greater the relief required the thicker should be the film. It should, however, even for the most uniform work, be of considerable thickness. This is allowed to dry, either spontaneously, by ordinary evaporation, or by being placed in an oven and heated moderately until hard.

Third. This film is now exposed under a negative of adequate density, such as are generally used in printing copies of line engravings, to solar light. Care must be taken to have the rays of light reach the negative directly from the perpendicular. To this end side light must be excluded, so as to prevent the film from being affected by diagonal rays. The amount of exposure to light is an important element in this process. This exposure can scarcely be too prolonged; it should be at least half an hour to direct sunlight. Portions intended to remain white may be protected by an opaque covering or coating on the negative. Two, three, and even five hours' exposure to diffused light (reaching the negative through a long box) is needed to complete the requisite action. This is to ensure the complete reduction of the bichromate to chromic acid, thus securing the most perfect insolubility of the exposed portions of the sensitive film, even in the finer details of the picture, and thus to keep all the lines on one plane.

Fourth. After the exposure of the film, the edges of the plate are provided with a rim of melted wax, which is to prevent the film from peeling from the glass by the continuance of any accidental peeling at the edges.

Fifth. To partially swell the film it is now soaked in cold water, but only during a limited space of time, dependent upon the thickness of the film and the quantity of bichromate used in sensitizing it, with the view of retaining a quantity of the bichromate as a base for the next subsequent operation.

Sixth. The film—still retaining a quantity of the bichromate—is then taken out and plunged into a solution of nitrate of silver. Here the swelling is completed, which condition is

indicated by the chromic acid in the affected portions showing marked signs of reddening. The silver solution, while increasing the relief, adds greatly to the sharpness of the same, and the resulting bichromate of silver affords the requisite basis for the subsequent operations.

Seventh. It is now washed under a tap, and immediately plunged into a solution of the sulphate of iron in water. This solution is acidulated, to enable the reduction of the metallic deposit to proceed more freely. The action of the iron solution is allowed to continue until the picture is plainly visible from the back of the glass in red lines upon a gray or dark ground. A metallic substratum is thus obtained which is homogeneous throughout the entire thickness of the film, instead of being a mere surface deposit. This is an essential element to the success of the work, and must be fully carried out. It has another important effect upon the film, inasmuch as it coagulates or 'cans' it, rendering it capable of enduring unaltered through the subsequent operations.

Eighth. When taken from the iron solution the plate is copiously washed under a tap, and immediately flowed with a dilute solution of the sulphate of potassium. This application turns the film to a black colour, consequent upon the reduction to the sulphuret of silver, and the action of the solution is continued until the entire deposit of metallic silver is uniformly reduced to a sulphure.

Ninth. In this condition the film is sufficiently electrolytic for all practical purposes. It may now be hung in the electrolyte bath, and there receive the metallic deposit of copper.

Tenth. To insure the easy and more rapid action of the battery we cover the sulphuretted film, after drying, with a coating of plumbago. The dried sulphuretted film receives the plumbago with the greatest facility, and it may be brushed on and polished as easily as on wax.

Eleventh. The plate is now attached to a wire or other suitable arrangement by which it may be connected in the precipitating trough with the positive pole of the battery. Here it receives the deposit, which may be completed with more or less rapidity, according to the condition of the bath, battery, &c.

Twelfth. In certain conditions of the copper solution the copper shell does not readily leave the film, but tends to adhere to it with sufficient tenacity to endanger the shell in being taken off. To preclude breaking it in stripping from the mould, the glass plate is evenly heated to a moderate temperature, in which condition the copper plate may easily be lifted off the glass, carrying the film of gelatine with it. It is then plunged into a solution of concentrated lye, which readily dissolves the gelatine, and leaves the face of the electrolyte bare and clean.

This is the complete process. We append the following references to details and modifications:—

First. Ordinary glue may be used in place of gelatine, being preferable for some kinds of work.

Second. The swelling may be brought about in a solution of alum, in a solution of the persulphate of iron, in a solution of tannic acid, and in other solutions and liquids, and the silver deposit be afterwards precipitated.

Having described our invention, we claim the following:—

1. In the preparation of photo-relief plates for printing, &c., the described process of effecting the complete swelling of the gelatine film as a continuous operation, after being partially swollen in water, by treatment with the nitrate of silver solution, substantially in the manner and for the purpose set forth.

2. The described process of producing the deposit of metallic silver on the surface and in the body of the gelatine film, in the manner and for the purpose substantially as set forth.

3. The described method of producing an electrolytic deposit of sulphuret of silver by means of sulphuret of potassium, substantially in the manner and for the purpose set forth.

4. The described process of producing relief-plates for printing and other purposes, consisting essentially of the several steps above described in the order of their succession, substantially as set forth.

VISCOUS AND COLLOIDAL SUBSTANCES IN THE DEVELOPER.

BY D. WINSTANLEY, F.R.A.S.

It is known that when viscous and colloidal bodies are added to developers, a retardation of development ensues,

and the substances in question may be looked upon as true restrainers. On the fourth of August last, whilst giving some attention to this matter, I re-performed experiments illustrative of the point.

Collodion plates were sensitized, and their halves exposed for equal lengths of time in immediate succession, the same instruments and objects in each instance being used. The halves were then developed simultaneously with iron solutions having equal strength; one half being brought out with plain iron alone, the other with iron which was saccharated. The following tabular arrangement of only three experiments will show the result at a glance the action of the sugar and its influence to restrain:—

EXPERIMENT 1.

Thick end of film—1st half of plate.

Developed with solution containing in one ounce—iron ammonia sulphate, $\frac{1}{2}$ dram.; water, quantum suff. Result—slightly more detail and slightly more density than the 2nd half.

2nd half of plate.

Developed with solution containing in one ounce—iron ammonia sulphate, $\frac{1}{2}$ dram.; lump sugar, 1 dram. water, quantum suff. Result—somewhat more development.

EXPERIMENT 2.

Thick end of film—1st half of plate.

Developed with solution containing in one ounce—iron ammonia sulphate, $\frac{1}{2}$ dram.; water, quantum suff. Result—slightly more detail and slightly more density than the 2nd half.

2nd half of plate.

Developed with solution containing in one ounce—iron ammonia sulphate, $\frac{1}{2}$ dram.; lump sugar, 2 drams. water, quantum suff. Result—less in development more uniformity, and better general effect.

EXPERIMENT 3.

Thick end of film—1st half of plate.

Developed with solution containing in one ounce—iron ammonia sulphate, $\frac{1}{2}$ dram.; water, quantum suff. Result—a little more detail, and density the same.

2nd half of plate.

Developed with solution containing in one ounce—iron ammonia sulphate, $\frac{1}{2}$ dram.; lump sugar, 3 drams; water, quantum suff. Result—prolonged development and much greater uniformity.

In the instances of two of the experiments recorded in the table, it will be seen that those halves of plates brought out with unsaccharated iron possessed somewhat more of density and detail than their neighbours, a circumstance, however, which must be attributed, as I have elsewhere shown,* to their being on the thick end of the film.

I am unable with certainty to name the date at which saccharine and colloidal bodies were introduced in virtue of their restraining powers as ingredients in developers, but I find attention called to them by Mr. Wharton Simpson in 1869.

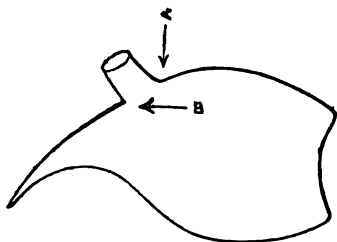
Concerning the mode of action which such bodies take, two statements only are all that I have found: the one, that they mechanically impede precipitation, and hence retard development; and the other, that they "cement together, as it were, the film and silver particles thereon."† The former of these ideas suggests itself as a rational hypothesis, but the latter, it is manifest, cannot be entertained.

If we allow a stone to sink or a bubble to ascend in a vessel filled with water, a certain time elapses before the journey is performed. If treacle be the medium used, that length of time will be increased; or if Canada balsam be employed, the time will be very much prolonged indeed before a bubble will get clear. And this, as I understand, illustrates the method of retardation supposed to be evinced when viscous and colloidal bodies are made use of in developers. To ascertain, however, for a certainty, if the explanation given be correct, it is desirable by some means to estimate the extent of the viscosity produced by the addition of various substances to the developer, for if the theory given be correct, the extent of retardation will be the same where equal degrees of viscosity have been obtained, no matter what organic bodies have been used. For the purpose, then, of measuring in some sort the "thickness" of various viscous fluids,

* *British Journal* 1874, p. 264.

† *Mr. Daniell in the British Journal*, 1874, p. 442.

I used a Schuster's alkalimeter—an instrument of the kind depicted here below. By fusion, and by filing, I



caused the opening in its nozzle to assume exactly such a size that the contents of the vessel when filled with water were capable of being discharged in a minimum time of sixty seconds. The vessel, in the case of each experiment, was filled to the lower portion of the neck (marked A), and when its contents were poured out, it was tilted to such an angle that the level of the fluid reached the portion opposite (marked B), the inclination being gradually increased to keep it there until the amount of fluid left was insufficient to reach that point, when this final inclination was preserved until the last drops were discharged. Repeated trials showed that when the vessel had been filled with water, the noted variation of the period of discharge was but one second out of sixty, and consequent experimental error under two per cent. Viscous developers were then prepared with different organic ingredients, and varying in viscosity from one degree (one minute in discharge) to four (four minutes in discharge). Their results were then compared, when it was found that the retardation did not depend upon the thickness of the fluid. Assuming no chemical action to have taken place (a point not easy to determine), it is clear that the mechanical action of viscous bodies in developers must be sought elsewhere.

It is known that the precipitated metal forming the photographic image penetrates the pores and exists within the body of the film, a circumstance which proves the developer to have preceded it in getting there; and I infer the probability of the film acting as a septum through which the saline ingredients of the developer have to dialyse before reduction can take place effectively. And this necessitation of dialysis I apprehend to be the way in which viscous substances retard the process of development.

HYALOGRAPHY AND ITS APPLICATION TO PHOTOGRAPHY.—LIGHT A MECHANICAL FORCE.

BY THOMAS SIMS.

APROPOS of this subject, a paper was published in the *Journal of the Photographic Society*, written by me about the year, I think, of 1859—60. (I have no means at hand of verifying the date). It is one of a series of some thousands of experiments of kindred nature which formed a mode of recreation at spare hours for some years. The substance of that communication, as far as I can remember, was the following.

A collodion positive on glass, made with a collodion the pyroxyline of which was of a powdery nature, or else the collodion of ordinary kind disintegrated by having alcohol of ordinary proof strength, and therefore having enough water to produce the effect. The exposure in camera was rather under than over timed; well developed with ordinary protosulphate or proto-nitrate developer; fixed with hyposulphite; and well washed, and dried.

After this, these photographs were put into sheet-iron boxes in a furnace, the fuel of which was either charcoal

or coke; here they roasted at a dull red heat for from a quarter to half an hour, during which time the collodion became calcined, and the silver partly reduced to the metallic state, and partly absorbed by the surface of the glass, the guide being the gamboge-like tint seen at the back of the plate when looked at in the light, glass being more sensitive to the sulphide of silver stain than any other with which I am acquainted. The image becomes indelibly absorbed, by continuing the heat long enough, in the most delicate and beautiful perfection.

The pictures are then exposed to the vapour of hydro-fluoric acid, a gentle heat being applied to the bottom of lead pan to drive off the vapour with sufficient energy, and the glass kept warm to prevent condensation of watery particles. After a short exposure to the action of the vapour, the plate is washed in warm water, and dried, when the result will be felt rather than seen, for very little can be seen by transmitted light if the glass is fit for the purpose of etching deeply.

Good plate glass is best. The natural surface yields a more visible image merely on the surface, but where etchings on glass are wanted to be looked at merely, finely ground glass is best, for where the silver image does not protect the glass the image will be more transparent, and therefore look dark by transmitted light after being etched.

If any one would wish to stain glass with all the delicate half tones and tracing of the photograph, the above plan is very easy and sure, only the picture must be made from the negative, i.e., a transparent positive. If fixed with cyanide of potass should be sulphurised afterwards, and washed. The result, after from a half hour to an hour or more in the furnace, will be the yellowish-brown sulphide of silver stain in the body of glass, everything being as smooth and delicate as, or much more so than, the original photograph.

The only way I could ascertain the extent and quality of such engravings was the following simple method. I put a thick slab of plate-glass on the table (a polished lithographic stone answers as well); a single drop of water is let fall upon it in the middle of slab; the engraved glass is put, back downwards, on the drop of water (this is to ensure adhesion, after which no ordinary pressure will break it); a piece of tissue-paper, which has been thoroughly and uniformly black leaded (such as is used for retransferring drawings), is laid, leaded side up, upon the engraving, and a piece of thin albumenized paper or ordinary writing paper which has no wire-mark is laid upon the leaded paper, and held firmly by the left hand, whilst the right uses a boxwood or ivory paperknife as a scraper. Very pretty blacklead drawings may be obtained in this way.

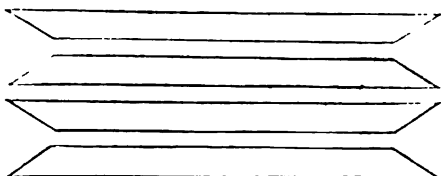
I am sorry I have not time to condense this communication, and yet say what I mean. My manuscripts have been laid aside many years, and I cannot now refer to them, but the date of the original communication may have been as early as 1854-5.

A few words on Mr. Bovey's ideas under heading "Light a Mechanical Force." All force becomes mechanical if applied. Whenever we by the laws called chemical disturb the affinities of material elements, we at same time unbend or retie the most titanic force or forces. Whenever there is chemical action taking place, then one of the phases of force shows abnormal conditions. Every ingenious invention which goes to prove this is useful, because it popularises science by giving ocular demonstration; but those who can deduce from the facts of general science, and such publications as Professor Groves on "The Correlation of Forces," Tyndal on "Heat and Light," Rev. M. Bircks on "Matter and Ether," &c., are as sure that light is a force as that heat is a force, or that electricity is a force; mechanical if mechanically applied, as though they could, like Ithuriel, ride on a sunbeam.

HOW TO MAKE A BELLOWS FOR A CAMERA.

BY R. L. F.

FIRST measure the inside of the camera, which is, let us say, a half-plate size, which we will say is 7 inches by 6 inches inside. Make a block or mould of boards nailed together a little smaller than the inside of camera—say about $6\frac{1}{2}$ inches by $5\frac{1}{2}$ inches—and a little longer than the bellows is required—say 15 inches. Get a piece of good black twill about 18 inches wide and long enough to go right round the outside of mould and lap over 3 inches. Paste the edges together, making a firm joining, taking care not to paste the mould. Over the whole of the twill paste a piece of orange-coloured paper free from holes. Then cut some pieces of cardboard to form the folds—say 72 pieces, 36 of which will have to be $6\frac{1}{2}$ inches long, and 36 $5\frac{1}{2}$ inches long, and each $\frac{1}{4}$ of an inch wide, with each end bevelled to form the corners. Commence about an inch from one end, and paste the pieces of cardboard on all round with the long and short bevils opposite each other, thus—



leaving a small space between each for folding. The long and short ends should come opposite each other at the sides when all are put on, which will be 18 on each side. Paste over the whole another thickness of orange paper, and over that again another thickness of black twill, best side outwards, making the lap where the bottom of the bellows is intended to be. Thin leather can be used instead of the outside twill, but I find twill answer admirably; one made with that material, for a 12 by 10 camera, I have had in constant use about twelve years.

It should now be left till quite dry, then taken off the mould and gently folded. About an inch is left at each end without cardboard for tacking inside the camera, which should be done with strips of leather or thin wood over it, so that it may hold it in the camera firm and strong. The bellows will be about $1\frac{1}{2}$ inches thick, and will allow focussing from about 4 inches to 14 inches. I find good flour paste, made rather thick, and with a little powdered alum in it, much better than glue.

If this description is not clear enough, I shall be pleased to give any further information I can.

NEGATIVE RETOUCHING VARNISH.

BY JEAN EPPEL.*

THERE are many kinds of retouching varnish used by photographers, some purchased commercially, some made up at home; but I must frankly admit that none of those I have tried have given me satisfactory results. Moreover, the mixtures that one buys are generally of an expensive nature.

For some time past I have prepared and employed with much satisfaction a formula for a negative retouching varnish which I can strongly recommend, and which is largely employed in Vienna, and has been for some time. It consists of a solution of American colophonium or resin in rectified oil of turpentine, so as to secure a liquid of the consistence of a transparent collodion. The proportions generally are:—

Oil of turpentine	...	...	...	2 parts
Resin	...	...	...	1 part

but they vary according to the nature of the constituents.

* Photographische Notizen.

The powdered resin is added by degrees, and it is allowed to dissolve by being placed in a warm locality (in the sun in summer), the mixture being shaken up continually. By adding more and more resin the right consistence is soon attained, and a little experience teaches what should be the proper thickness; the resin should dissolve entirely without leaving any residue behind.

To apply the varnish a small quantity (about two drops for a carte-de-visite) is put upon the negative and rubbed over by means of a soft linen rag which is stretched over the finger, the rubbing being done in circles. If the rag sticks much to the film during the rubbing, the solution is then too thick, and must be diluted with a little oil of turpentine.

The varnish is allowed to dry upon the plate for a few minutes, and then it is possible to retouch the surface with any pencil, no matter how soft or hard, as well as upon paper. I generally employ Hardmuth's Nos. 3 and 4, which generally answer for most purposes. In order to put in high lights in the flat portions of drapery, &c., I seldom employ colour, but make use of No. 2 pencil, by means of which the most effective high-lights may be secured, such, for instance, as are seen upon lace, &c. As a rule I render all high-lights with No. 2 pencil, and retouch face and hands with No. 3; while to make any portion more harmonious and to give the appearance of uniform grain I employ No. 4. Transparent spots in the negative I prefer to cover up with white, which seems to me to answer the purpose better than carmine.

In order to remove any retouching from a negative which does not appear sufficiently good, I take pure oil of turpentine, and rub over the surface with a soft linen rag just as I described above when applying the varnish. The varnish may also be used with safety for the manipulation of very old plates, as by its employment no fear need be entertained of the film breaking or springing, as is often the case when old films of varnish come to be worked upon by a sharply pointed pencil.

Correspondence.

DEVONSHIRE SCENERY.

SIR,—There is one spot I ought to mention before passing on to Clovelly, that is well worth at least three or four negatives: I refer to Kenwith Castle, in Abbotsham, and now occupied by the worthy rector of that parish. This place is about two miles from Westward-Ho, and has a name, a character, and a history; or, rather, it occupies just that line between myth and history. It was occupied by Odun, the brave Earl of Devonshire, who fought Hubba, the Dane, and defeated him under the castle walls, and drove him into the sea. Our postman poet, Capern, has embodied this page with a living reality:—

“The Danes were below the castle wall
When Hubba spoko to his band,—
“This tower so strong, my true men all,
No Northman shall withstand.”
Spake Odun, the Earl of Devonshire,—
“Thy Northmen may be true,
But before brave Odun yields his sword,
They have much rough work to do.”

Though this place is much modernized, yet the grounds around it, rising in artificial mounds, indicate that the place was used for defensive purposes.

Portledge, Peppercombe, and Bucks will well repay some hours to each place. The points are easily reached from the main road to Clovelly. The two former have never been done; each has some fine bits of rocky scenery. The first-named place is remarkable for the termination of the red sand bed that runs in a narrow strip through the whole of the North of Devon. Peppercombe has a place known as the “Castle,” but why it is called by that name I am unable to say; but that object, with the limekilns and rocks in the foreground, make a good picture. The morning, in fact the early morning, will be the proper time to take each of these places. These spots

lying rather out of the beaten track of tourists, have not been brought into notice by professional photographers, because not seen, however beautiful, as a rule, "will not sell," consequently will not pay for doing. Bucks M'Is, lying within sight of Clovelly, has only been photographed by one professional photographer, and only with partial success, the points from the beach being left untouched. These are well worth doing, and, as a commercial speculation, would sell with the other local views, because there is a peculiarity and quaintness about the place that is equal to Clovelly, and it is all its own.

Two miles further on we come to the "Hobby Drive" of Clovelly. Everybody does the "Hobby Drive," and certainly it is one of the most charming that can well be imagined. For two miles we pass under a canopy of thickly netted trees, through which, ever and anon, peeps of sea, and the wooded landscape. When the "Quarter Deck" is reached a pause is invariably made, for this is the grandest part of the drive. This also is the favourite halting place of the photographer. The eye rapidly passes down the green and wooded slope to the open patch of deep emerald below, then to the serried oaks that looked matted, as they rise like terrace after terrace with the bend of coast until the eye rests on the extreme limit of land jutting out into the Channel, and known as Hartland Point. Clovelly lies below on the greatest bend of the bay, flashing back the rays of the morning sun from its white cottages and the dense masses of foliage, while shooting out from its little semi-circular pier are the red-winged trawlers; and clear and bold rises Lundy Island, its white lighthouse glittering as a pillar of salt, and the grey granite peaks of Rat Island wonderfully distinct. This clearness of Lundy is known to fishermen as a sure sign of rain. This is the picture from the Hobby Drive—this the favourable moment for securing a picture. How miserable have been most of the attempts to secure it! Yet it is a picture that is greater in demand than any in the locality. Some of the causes of failure arise from things over which the photographer has no control, such as the contrast between the dark foliage and the strong actinic power of the sea. But the general fault, over which they have command, is the use of short-focus wide-angle lenses which dwarf the distance. I fell into this error myself; but I saw a picture the other day in which this was avoided, and there would have been but little to be desired but for the sea being almost a patch of white. The morning is the best time for taking this view. Pass on towards the village, and some four or five negatives would well repay the trouble of securing. Having reached it, the first business after supplying the wants of inner man at the New Inn, there being but another hostelry there, will be to take a walk down the steep and slippery street to the little pebble built pier, and take a look at the tiers of cottages that rise above. One is at once struck with their picturesque character and peculiar quaintness, and how any one, whether he be fisherman or not, could be so drawn at some remote period to fix his dwelling on the very edge of the rock against which the sea was ever beating. It will be seen that all the views from the pier and beach will be better taken early in the morning. The special views I will point out, with the interest attached to them.—I remain, sir, yours respectfully,

Bideford, May 18th.

THOS. TEDRAKE.

WHAT TO DO WITH RESIDUES.

DEAR SIR,—As an amateur photographer with a fair knowledge of practical chemistry, I was very much pleased with your article under the above heading, and it so completely accords with my own experience, that I quite agree with you that it is high time the grievance should be remedied.

Only last week a photographer told me that he sent sixteen ounces of residue to a refiner, who sent him back two and a-half ounces of nitrate of silver as its value; whereas, taking his account of the character of the "waste," I feel confident that it contained at least six to eight ounces of the metal itself. This matter in my opinion is one capable of an easy and effectual remedy; but the first step is, that photographers should be able to judge for themselves, within moderate limits, the approximate value before sending it to the refiner. This can be learnt literally without any chemical knowledge, and I propose (if you approve) in two or three very short articles to give a few data by which they may be able to protect themselves.

I may say that my object in doing this is simply from the

fact that as an amateur I owe a great deal to the profession. I have found, rather to my surprise, that photographers are less selfish than most men, and in trying to obtain the practical knowledge I required, I have found them always ready, not only to impart the information I have asked, but to put me up to the little "wrinkles" and "dodges" which are of such great practical value. If I can in a slight degree repay the obligation it will give me much pleasure.—I am, dear sir, yours, &c.,

PHOTO CHEMISTS.

[We shall have much pleasure in receiving the further communication of our correspondent.—]

FLEXIBLE NEGATIVES.

DEAR SIR,—In your leader of yesterday I find a suggestion that had also occurred to me—to use sensitized bands.

Further on the effect of texture is deplored.

I have had a "happy thought." When in the East, I often admired the Chinese and Japanese translucent "rice paper," which I think is just what we want to produce a flexible negative. It presents an appearance similar to that of a very thin sheet of white wax, such as is used for artificial flower making, but is much stiffer, and although it would not bear doubling up, it might be rolled. Further, there would be no difficulty in obtaining the article in quantity at a very moderate price.

I had not, at the time I refer to, been bitten by photography, or should probably have tried the question on the spot. I have none of the paper by me, but if any of your readers should possess specimens of the pretty Chinese raised pictures done on this paper, and be willing to sacrifice a curio to the art, I hope they will acquaint me with the result.

In the mean time I shall endeavour to hunt up a sheet or two and try for myself. I scarcely doubt success, and will certainly communicate the result through your columns.—I am, dear sir, yours truly,

E. T. ROLLS.

Alma Cottage, Lympstone, Devon, May 13.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society took place on Friday, May 14, in the rooms of the Society of Arts, the Rev. F. F. STATHAM, M.A., F.G.S., president, in the chair.

The minutes of the former meetings having been read and confirmed,

Mr. J. R. SAWYER gave some interesting details of the gradual progress of carbon printing from its origin, and very clearly stating the improvements made by each inventor and discoverer who had given attention to the process, from Mungo Ponton, Becquerel, Poitevin, Blair, Abbe Laborde, Swan, Johnson, to the latest improvements in double transfer invented by himself, consisting of a moist adhesive flexible support to the carbon tissue which, when dry, allowed the picture to be peeled off. A practical demonstration of the process by Mr. Sawyer was then given.

The PRESIDENT, in passing a vote of thanks, said he was most particularly pleased with the history of carbon printing which Mr. Sawyer had so graphically described, and asked whether the process was applicable to large works, such as copies of oil paintings, &c.

Mr. SAWYER said that for very large prints there was no other way than the flexible support, and that it was being used for works 40in. by 36in. Replying to a question by a member, Mr. Sawyer then made some practical remarks respecting the printing in conjunction with the use of the actinometer, and threw out a hope that some day it might be possible to see the printing.

An interesting conversation ensued, during which it was stated that any amount of brilliancy could be given to a carbon print by hot rolling.

Mr. WILKINSON then read a paper entitled "Archer's Formula," and then put a question to the members, enquiring why chlorate of silver (as mentioned by Archer for the exciting bath) was not experimented with now?

Another interesting and practical conversation then took place.

The CHAIRMAN said it was often useful to look back to old formulae, and thought, by careful reading of old original ideas, a large amount of information might be gained.

After a vote of thanks the meeting was adjourned.

Talk in the Studio.

SPIRIT PHOTOGRAPHY.—The subject of "spirit" photographs has again been exciting attention in the United States, and was recently discussed at the Photographic Section of the American Institute, some of the members affirmed that they had seen "spirit" photographs produced under test conditions where every care was taken to preclude the possibility of imposture, the portraits being easily recognized as those of persons no longer living in the flesh.

POWDERED GLASS.—Glass may be powdered to render it suitable for glass paper, for filtering varnishes, &c., by heating it red hot and then suddenly plunging it in water.—*Scientific American.*

LEAF AND FLOWER IMPRESSIONS.—Take a small quantity of printer's ink thinly put it on glass, or on the lid of a blacking box, as I did, evenly distributed. The end of the index finger will serve, as the printer's ball, to cover one side of the leaf uniformly; then lay it to the exact place where you wish the print to be; lay over it a piece of thin soft paper large enough to cover it; then, without moving the leaf, press all parts of it with the end of the thumb firmly, and you will have a perfect impression that no engraver can excel; and, by adjusting the leaves at the proper points, accurate prints can be taken, and, aided with the brush or pen, the stem and whole plant can be shown. I have excellent specimens of impressions of barks of trees, made by slicing the bark; and, with a little care, the stems can also be taken, as well as flowers. I have many such; and, when coloured with the aniline colours, they are like coloured engravings.—*Ibid.*

To Correspondents

APRIL.—The black spots on the negative are clearly due to particles of foreign matter; that is, they are due rather to mechanical than to chemical impurity. At first sight they appear to arise from turbidity or floating particles in the collodion; but on closer examination we are inclined to think they are due to particles of dust, or of the material used in cleaning the plates, which had been left in the rough edges of the plate, taken up by the collodion, and floated on the surface. They manifestly follow the flow of the collodion. The fine textural lines to which you refer are due to the collodion, which yields a film containing a delicately reticulated film. It may be due to the use, in the collodion, of spirits insufficiently highly rectified, or to a pyroxyline made at too low a temperature. If you allow the film to set well before immersing in the silver bath it may improve matters a little.

G. B. CROMPTON.—The Art Union was drawn, and the winning numbers advertised some weeks ago.

A YOUNG PHOTOGRAPHER.—It is never very easy to get a really fine copy of a paper print; but the proper plan is to take a negative of it in the camera. A print may be copied by printing from it in the pressure frame first a negative, and then from that negative another print; but a considerable degree of coarseness and exaggeration is produced by this method. The best plan is to roll the print well, so as to secure a very good surface; then place it in a light where it is equally illuminated from all directions, and take a negative of it, and then proceed in the regular way.

J. D. L.—Thus you mark B are in some respects similar to those marked A but not in any respect superior. 2. Equal parts of ether and alcohol may be used for thinning the collodion. The ether should be, as nearly as you can possibly get it, anhydrous, and the alcohol should not be less than 60 over proof; it would be better for being more highly rectified still, say 64 o.p.—that is, 82.21 specific gravity. 3. Varnishing with a solution of india-rubber will doubtless answer. Chloroform is expensive, and bisulphate of carbon offensive. A good plan to make such a varnish consists in shredding the india-rubber finely, then adding chloroform enough to soften it into a paste. In this state benzol will dissolve it, and cost less than the one, and smell less offensively than the other of the solvents you name.

NORTHUMBRIA.—The original negative from which your enlarged paper negative has been obtained is manifestly a somewhat hard one, and the effect of coarseness is very much due to this fact. The special sample of albumenized paper used for the enlarged negative is also somewhat coarse in texture, and this adds to the lack of delicacy in the final result. A piece of plain paper of very fine texture would probably answer best; but it is possible that a carbon print might also answer. 2. The lens in question is pretty good—indeed, as good as most single lenses—for pure landscape work. Almost any carefully made actuated single lens answers well for ordinary landscape work. The refiner whom you name was, we believe, the one referred to as giving a satisfactory price.

C. T. ROLLS.—Boracic acid was doubtless meant. We have not tried it; but we think you are in error in supposing that boracic acid would precipitate the silver, unless, indeed, the silver solution were alkaline.

A. MCS.—Many thanks. You will see, however, that the information was given in our last.

S. H. ASHLEY OAKES.—Many thanks for your courteous information, which is, however, very sad.

J. BYRNE.—Thanks for further hints. We shall again call attention to the matter shortly.

ALBERT SCHREIBER.—If we hear of anything likely to be of use to you, we will write.

CAPTAIN TURTON.—Thanks. We will with pleasure add your name to the subscription list. We shall look with interest for the experiences you mention.

W. A. C. A. wishes to thank those of our correspondents who have given him information in relation to the scenery of photographic interest in Devonshire.

D. DE LAUNCE.—Thanks. The matter shall receive attention in due time.

J. MCG.—The advertisement, so far as we know, is *bona fide*, but inquiries will be made as to correctness of address. Several correspondents in our next.

METEOROLOGICAL REPORT FOR APRIL.

BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven, 36 feet above sea level.

Date.	Barometric Pressure.			Temperature.			Direction of Wind at 9 a.m.	REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1 30-42	30-42	30-39	46	50	45	—	—	Fair, but cloudy.
2 30-30	30-10	29-55	43	47	43	S.W.	—	Fair, but cloudy.
3 29-46	29-45	29-39	44	44	46	S.	—	Hazy a.m. and p.m.
4 29-40	29-31	29-18	43	46	45	N.W.	—	Rain this morning.
5 29-30	29-20	29-00	43	44	42	S.	—	Showers a.m. and p.m.
6 29-14	29-15	29-15	43	48	44	S.	—	Sunny during the day. Strong wind, with rain, 9 p.m.
7 29-13	29-22	29-41	40	44	38	W.	—	Fair and sunny. Aurora 10 p.m.
8 29-05	29-70	29-81	43	43	44	N.W.	—	Fair, but cloudy. Windy.
9 29-05	30-00	—	41	49	44	N.W.	—	Fair, but cloudy. Windy.
10 30-12	—	30-10	43	—	43	S.S.W.	—	Fair and sunny. Windy.
11 30-00	30-00	30-10	43	55	47	N.W.	—	Fair and sunny. Very fine.
12 30-14	30-14	30-14	44	51	45	N.N.W.	—	Fair and sunny. Very fine.
13 30-19	30-15	30-15	45	51	45	—	—	Fair and sunny. Very fine.
14 30-18	30-18	30-20	44	51	43	N.N.W.	—	Fair and sunny. Hazy.
15 30-21	—	30-19	44	56	48	S.W.	—	Fair and sunny. Hazy.
16 30-13	30-13	30-15	48	51	46	S.	—	Fair and sunny.
17 30-08	30-24	29-58	51	58	44	S.	—	Fair, but gloomy.
18 29-02	29-24	—	50	58	50	S.W.	—	Fair and sunny.
19 29-01	29-03	29-08	56	63	51	S.	—	Fair and sunny.
20 29-07	29-03	29-04	51	63	51	S.	—	Fair, but gloomy.
21 29-07	29-03	29-00	53	62	45	S.W.	—	Fair and sunny.
22 29-03	29-00	29-03	44	46	40	S.E.	—	Fair and sunny.
23 29-00	29-07	29-03	48	51	46	E.S.E.	—	Fair, generally sunny.
24 30-01	30-09	—	47	—	38	S.	—	Fair, generally sunny.
25 30-09	30-01	30-03	—	52	44	S.	—	Fair and sunny.
26 29-04	29-09	29-03	49	51	47	—	—	Gloomy all day. Rain commenced at 6 30 p.m.
27 29-02	29-02	29-08	50	53	46	S.	—	A little rain this morning.
28 29-01	29-07	29-03	—	54	50	S.W.	—	Fair, but gloomy. Fog this evening.
29 29-02	29-05	29-03	48	56	48	S.S.W.	—	Rain this morning.
30 29-00	—	29-03	52	58	48	S.	—	Fair and sunny.

Summary.

	Maximum temperature observed	...	...	Mornings.	Noons.	Nights.
Minimum	ditto	...	...	56°	63°	51°
Mean	ditto	...	...	40	44	38
				47.4	52+	45
Mean of whole	...	...	...	48.1°		

Fair days during the month ... 23
Days on which more or less rain fell ... 7
Fair days, sunny ... 16
Fair days, gloomy ... 7

NOTE.—During the month, as will be seen from the foregoing table, we have had very fair weather; out of 23 fair days 16 having been bright, and generally the light has been very active. It will be remembered that April, 1874, was very warm, considerably warmer than April, 1875, as will be seen by comparing my tables in your impression of May 8th, 1874, with the present. The rain during the month amounted to 1.11 inch, and evaporation to 2.34 inches. The first appearance of swallows—which generally visit here very early—was on the 12th, and the cuckoo was first heard on the 21st. The weather up to to-day is fine, but hazy. Rain is much wanted to promote vegetation.

Braystones, near Whitehaven, May 3rd.

The Photographic News, May 28, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

GINX'S BABY—SALICYLIC ACID—THE VIENNA EXHIBITION—
LORD LINDSAY.

Ginx's Baby.—Few photographs have acquired such fame as Mr. Rejlander's "Ginx's Baby," which is to be seen in the windows of every photographic dealer, and which is one of the few, the very few, studies produced by that master photographer, of a profitable nature. Mr. Draper, an old friend of Mr. Rejlander, and well known as one of the founders of the Savage Club, in writing about copyright the other day in the *Pictorial World*, tells us something about this popular little picture. Mr. Rejlander one day had an infant for a sitter, and before he could obtain a presentable likeness, suddenly caught the child in a fit of passion. The image thus produced, he enlarged, touched with chalk, and again reproduced. After he had taken all this trouble to secure a good artistic picture, somebody came forward alleging that he was the grandfather of the original subject, and claimed, not only copyright, but actually an account and payment of all profits made by the sale. Nay, more, he even issued a writ to enforce his claim, although he did not, fortunately for Mr. Rejlander, continue the proceedings. Thus the proceeds of this picture, which was, perhaps, the only one that ever brought its producer a slice of luck, was well-nigh being lost in law expenses. We believe that seven or eight thousand of this little picture were disposed of, and although but a tithe of the profits only reverted to the photographer himself, these amounted to a substantial sum. When first sent in for exhibition at Pall Mall East, the picture was called "Mental Distress," or something of the kind, but the Secretary, in cataloguing, re-christened it on his own responsibility, and gave to it the title of Mr. Jenkin's popular little book. The change did not, however, please the artist, and he demanded that the original title might be substituted in the next edition of the catalogue; but his request was of little avail, for despite all he could say, "Ginx's Baby" was in everybody's mouth, and it was already beyond the power of any one to change the name.

Salicylic Acid.—Salicylic acid, the use of which has been recently suggested in photography, is a good preserving medium for many things, and will no doubt be found useful as a means of preventing the decomposition of some of the liquids and solutions used by photographers. Further experiments are necessary to determine the influence of this body upon the chemicals and compounds employed in photography, but it may no doubt be used in most cases in lieu of carbolic acid. It is difficult to dissolve in cold water, but is readily soluble in hot water, as also in both alcohol and ether. It has far more antiseptic action than carbolic acid, and has neither the disagreeable taste nor smell of the latter. It lends itself, therefore, readily to medicinal purposes, and would be exceedingly useful for preserving eggs, fruits, and vegetable matter of various kinds, such as are prone to become mildewed or rancid. Salicylic acid has been known for some time past by chemists, but it is only lately that Dr. Kolbe, of Leipsic, has shown how it can be made artificially in large quantities and at a moderate cost. We should think that in most cases it might be employed for preserving solutions of gelatine, albumen, starch, &c., sweet and good; but we repeat, photographers will have to study its action more closely before it can be universally employed in manipulation.

The Vienna Exhibition.—The opening of the Austrian Photographic Exhibition has taken place at Vienna, and we have news that the collection is considered a satisfactory one. The exhibition is held in the Imperial Museum for Science and Industry, and the pictures, to a large

extent of a high character, make a most favourable impression upon the visitor, the lighting, with one or two exceptions, being very satisfactory. The best pictures in the exhibition, according to the *Photographische Notizen*, are some magnificent prints of large size, taken by the Court Photographer, Victor Angerer; Fritz Luckhardt's stereoscopic studies, which it will be remembered attracted much attention in our own exhibition two years ago in Pall Mall East; some portraits, large size, of Vienna celebrities taken by J. Gertinger; some excellent transparencies of microscopic subjects prepared by Carl Haack, of a class therefore, such as have as yet been little included in exhibitions in this country; studies of animals by L. Schodisch; interiors by Rückwardt of Berlin, Lichtdruck prints by Rommler and Jonas of Dresden, phototypes of L. C. Zarnarski of Vienna, a collection of Aubledruck prints by Aubel and Kaiser of Cologne, &c. Great Britain is represented by Brownrigg of Dublin, Hedges of Lytham, and H. P. Robinson of Tunbridge Wells; in the latter case, the pictures exhibited are those that won the "Good Taste" medal, Vienna 1873, and are the property of the Vienna Society.

Lord Lindsay.—It is gratifying to learn that Lord Lindsay is again comparatively restored to health after his expedition to the Mauritius. The press of work and excitement connected with the observations of the transit of Venus, together with the unhealthy climate of the island, combined to throw his lordship into a violent fever, and for some months his health has been such as to give cause for much anxiety among his friends. A return to England was not permitted for some months after his arrival in Europe, a prolonged residence in Italy being insisted upon by medical men. We are glad to hear, therefore, that Lord Lindsay has returned so far to his previous state of health as to take part in a fête prepared in honour of his return by the Conservative working men of Wigan, which town Lord Lindsay has represented in Parliament since the last election. We are informed that many thousands of people thronged the streets to welcome him back after his tedious, though successful, journey to view the transit of Venus, while bands of music paraded, and the church bells were set going. The horses were unyoked from his lordship's carriage, and this was drawn through the town to Haigh Hall, the residence of his father, Earl of Crawford and Balcarres, amid the cheers of the people.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER V.—COLLODION.

ALTHOUGH so many samples of commercial collodion are very excellent, and, perhaps, from the large quantities made up at one time, of more reliable and even quality than the operator can make up for himself, I think it certainly not a waste of time for him to learn how to make it for himself. Should I even advise the student to procure for his early use a good sample of commercial collodion, I should yet think he ought to know of what it is composed, and the nature and properties of these several ingredients.

Collodion is made by dissolving pyroxyline or gun-cotton in a mixture of ether and alcohol. Pyroxyline is insoluble in water, alcohol, or ether, but with regard to the last-mentioned, many samples contain a percentage of alcohol; in these pyroxyline is sparingly soluble, but in alcohol and ether, of almost any proportion, it dissolves quite readily. A mixture of about equal parts is generally adopted in making collodion for ordinary use. Certain iodides and bromides are added to excite or sensitize the collodion, the iodides and bromides of ammonium, cadmium, and potassium being those most generally used—all, except potassium, being readily soluble in collodion. Collodion may

be "iodized" at the time it is made—that is, sensitized by the addition of the iodides and bromides according to the formula by which you are making it—or it may be kept "plain," to be iodized as you may require it.

Plain Collodion is made by adding ten or twelve* grains of pyroxyline to every ounce of alcohol, and when it is well soaked, adding an equal amount of ether. The cotton may not entirely dissolve, nor is this an evidence of a bad sample of cotton. When the collodion is settled perfectly clear it should be filtered through filtering-paper or cotton (it being advisable to cover the filter with a plate of glass to prevent evaporation as much as possible), and preserved in a cool place.

The *Iodides and Bromides* used in the manufacture of collodion have various effects on it—those of an acid reaction, such as the iodide and bromide of cadmium, having the tendency to thicken and glutenize the collodion, tending to retard its setting on the plate, but giving a depth and richness to the negative; while the alkaline iodides and bromides, as those of ammonium and potassium, have rather opposite effects. They tend to render the collodion, in time, more liquid, and, liberating free iodine, give the collodion a red colour, and destroy its sensitiveness; they, however, give the required intensity quickly, and cause the collodion to set rapidly.

THE SENSITIZED COLLODION

requires care, cleanliness, and some little intelligence in its preparation, together with the proper purity of the chemicals used. The reader, if he has studied photographic literature to any extent, will have noticed that almost all writers differ in the proportions used in portrait collodion, and to a great extent in the iodides and bromides used; but a great number, if not a majority, seem to agree that a proportion of three grains of the bromides and five of the iodides to the ounce of collodion gives the best results. I shall not, therefore, be giving anything new in the formula I subjoin, though I have a lurking fear that I shall be looked down upon that I do not produce something more startling. To disarm criticism on this point in some measure, I may say that it is rather my intention to endeavour to be of use to the reader by furnishing him plain and reliable instruction, than to give him difficult and doubtful problems to solve:—

Alcohol and ether ...	5 ounces each
Cotton 6 grains to the ounce of alcohol and ether	
Iodide of ammonium ...	25 grains
Iodide of cadmium ...	25 "
Bromide of ammonium ...	16 "
Bromide of cadmium ...	16 "

Grind these in a mortar, adding the alcohol, and as they are dissolved pour the liquid into a bottle of sufficient size for the whole. There should be no residue, if it has been properly done. The above are all readily dissolved in alcohol and ether, but where bromide of potassium is substituted for ammonium, the operation of dissolving it is more difficult, potassium being very sparingly soluble in alcohol, and scarcely at all in ether; but by uniting it with iodide of cadmium the difficulty is at once overcome. Grind the potassium fine in a dry state, and add to it, gradually, the iodide of cadmium until they are thoroughly incorporated; now moisten with alcohol until, evaporating, it leaves behind a snow-white paste. Continue to add alcohol, and grind, pouring off, after each addition, into the bottle until all is dissolved. When all the iodides and bromides are dissolved, the ether must be added a little at a time, the mixture being agitated before each addition of ether. When you have added all the ether, filter this mixture through filtering paper, through which it should run pure and clear. You can now add the cotton, tearing it up into little tufts. A little shaking will aid in the dissolution of the cotton. There may be a

trifling sediment of cotton, but this does not greatly matter. When this has settled perfectly clear, as it should in a day or two, it will be improved by an addition of some old collodion of the same formula, and will continue to improve with age.

When this collodion is poured on the plate, it should flow perfectly smooth, and be quite transparent. The plate being well dusted, and carefully guarded from dust which may (but shouldn't) be flying, the film should be soft, and free from ridges or lumps; but as the ether evaporates, leaving the alcohol in excess, the collodion will show signs of glutinizing, setting on the plate in lumps and ridges. The remedy is to add ether in the manner already described, until these ridges cease to appear. Filter after the addition of ether in all cases.

The collodion, when first made, should be of a lemon colour; a dark red denotes too great acidity, and this may be neutralized by the addition of half a grain of bicarbonate of soda; but it were preferable, when it is too acid, to reject it, and seek purer chemicals.

In flowing a glass plate with collodion, the residue should be poured into a bottle kept for the purpose—not back into that from which it was poured. All bottles holding collodion should be kept well stoppered to prevent evaporation. To flow a plate, stopper the bottle, and take another to receive the surplus collodion from the plate; and that, without agitating the plate in hand, the young student will find is no easy matter, but he will manage it with practice. Do not get into a clumsy way of doing it at first.

THE PRACTICAL PRINTER IN AMERICA.

XXVI.

FINISHING THE PRINTS.

When the prints are mounted, all spots are to be touched out, and the high-lights in the eyes, &c., are to be placed in, as will be presently shown. It is not at all necessary to wait until the cards are dry to do this, but, on the contrary, it is perhaps better to touch the spots out while the cards are damp, so that if an ordinary roller is used the prints can be rolled while a little damp, and a better polish is thus secured.

When the beginner commences this work on the prints, he will then, if not before, see the importance of thoroughly dusting the negatives while printing, as the neglect of it will here occasion him considerable trouble, as well as the final result not being so nice as it would be if there were no such places to be touched out.

For this reason I have often thought that if the beginner was served as I was when I commenced to print it would be a good thing: it was to assist at printing on one day and the next to assist at the touching of the prints, for the space of a fortnight or so: and thus he would learn how much trouble was saved by a little care being taken in the first place, and a valuable trait towards making a good printer would be early acquired. But even if the greatest pains were to be taken in the dusting of the negatives, there are instances in which it would not prevent some places from printing—said places being in the film that is on the glass, occasioned in some of its manipulations, such as the varnishing, or by some defect in the glass itself, either scratches, bubbles, or something of that sort.

It is on account of the unnecessary trouble occasioned in the touching out of these spots that I have, in a previous chapter, recommended not to "touch out holes" in the film any larger than what is necessary, and also where there are scratches, whether large or small, to print the negative either under one or two ground glasses, and even sometimes a tissue-paper, so that such places will not show any more in the resulting print than what is really necessary.

A good printer will assist those whose duty it is to do the mounting and finishing of the prints as much as is in his power, as well as the position artist, operator, or chemical

* The quantity very much depends on the sample used, and no strict rule can be laid down.

manipulator tries to assist him (the printer). A very noted New York photographer once said to me: "In my gallery, the object of those in each department is to assist each other as much as lies in their power, by doing their work so that they will not have to rely upon the person or persons whose duty it is to do the next in routine to cover up their defects; for there is always enough of their own work to do, without doing any more of another's than what is absolutely necessary."

There is no small amount of work to be done by the lady in touching out the absolutely necessary spots on the prints, as any one who has ever tried to touch out can tell for a certainty, it being likened unto the work of a negative-toucher, both of them being more or less severe on the eyes.

Any good brush, of a suitable size and with a good point, will answer for this purpose. In the mixing of the colours, which should be done every day, proper attention should be given to obtaining the same tint as the tone of the print indicates to you, so that the touched-out places will have the same appearance as the rest of the print. Water colours are used, India-ink, yellow and red colours predominating in the mixing, according to the tone you desire, which is generally of a reddish tint.

In applying the colour to the prints as it is now, they will dry dull, and when looked at obliquely these dull spots will show badly on account of there being a glaze to the print everywhere except where this colour is applied. To obviate this, a liquid solution of gum-arabic (made by dissolving the gum in as little water as possible) is mixed with the colours in such abundance as to give a good gloss to the prints when they are touched.

More often, instead of dissolving gum-arabic as described above, a lump of the pure gum is wetted with the tongue and rubbed through and through the mixed colour, and the remainder of the lump is stuck to the palette upon which the colour is to be mixed. In touching out, in case the colour after a while shows no signs of the arabic, then first rub the wet point of the brush on the lump of arabic, and then take up some of the colour and proceed to touch out the spots as before. The use of the arabic makes the colour a trifle more difficult to take to the prints, but after awhile you will not notice it. A glass of clean water should be near at hand for you to wet your brush in and to cleanse it when necessary. The beginner in touching out with the brush and colour should be careful and not touch too heavy as well as too light, and never leave a spot unless the colour applied gives the same dark tint as the surrounding places, and he should not touch out a larger spot than what the spot really is. A little experience will tell him what is to be touched out, and what is not.

All dirt spots (i.e., light spots on the prints which are usually caused by dirt adhering to the varnish of the negative) should be touched out wherever they occur. The most noticeable places are in the draperies, face, background, &c. The unevenness, if there is any, of the retouching should also be attended to—i.e., those parts on some parts of the face which are lighter than the surrounding parts, caused by the pencil of the retoucher taking too heavily.

I mentioned above about placing the high-lights in the eyes, and as the beginner may not know what I mean by it, I will here explain. In many prints the eyes, owing either to the carelessness or ignorance of the operator, have no high-lights in them, and when such is the case they should be placed in each eye, at the proper place, by the brush, upon which a little white paint (water colour) is dissolved. The greatest experience is required to do this as it should be done, and the apprentice should never attempt it on his own responsibility until he has been thoroughly taught how and where they should be placed. In many cases the high-lights should in a measure be touched out, and all other reflected lights should be removed.

A common lead pencil of a medium grade of hardness is used for the purpose of modelling the face, as well as touching out the slight spots that are in the face, draperies, &c.,

whether occasioned by the retoucher in touching the negative, or by the printer in printing them. The Siberian Graphite, No. 2, H. B. pencil, I have used with very good results. A good, not too sharp, point is made, and a slight touch of it will very neatly touch out the thin and long dirt spots, and in modelling, both in the lights and shades, it is capital. There will not be enough difference in the tone of the pencil-mark and the colour of the prints to cause any attention from this source, unless the places are larger than the head of a tolerably large common pin. The pencil very often reaches places more easily, and can be used quicker than a brush, therefore it is used considerably, when it can be, with good results. For diving in between the shadows in the cheeks, and filling them up (not too much), and touching out those dirt spots which may happen to show on the high-lights, and in all places where only a very slight touch is required, the pencil is much better than the brush, as it will make a much better mark.

To ease the eyes in touching out the minute spots a large magnifying-glass is placed conveniently in a sort of a vise, by means of a suitable rod which is attached to the glass. This glass is placed at some six inches from the prints, and the person touching out can not only do the work better, but the trying of the eyes is in a great measure prevented. A little flesh-wash is given to the cheeks and lips of the ladies and children with good effects.

NOTES ON RETOUCHING.

OUR Chicago contemporary continues the useful articles on this subject.

Freckles.—Experience teaches that negatives requiring much work upon every part of the face will never produce thoroughly artistic prints, and a negative that will become sufficiently smooth by working only upon the lightest and nearest portions, leaving the receding parts delicate and shadowy, will produce a face of wonderful relief and lifelike brilliancy. The class we are now considering seem to baffle our attempts at perfection in this respect by forcing us to carry our work far beyond the desired limits.

Of course, good taste and ability in the operator may, and often does, greatly reduce our work, by throwing forward the focus on the face and producing a proper detail in the shadows. But to be sufficiently comprehensive we will suppose these negatives under consideration need very much retouching to make them smooth. The first work put upon them is the most difficult and important, that of touching out the freckles, and requires the aid of a magnifying glass, until every one, however minute, has disappeared. To do this the utmost care must be observed not to use too great force with the pencil, as no amount of after-work can make a smooth surface if coarsely done this first time. No stroke of the pencil should be observable except in effect, and the old adage, "The more haste the less speed," was never better applied than in this work. After the freckles have all disappeared, lay aside the glass, and, from a sufficient distance to enable the whole effect of the work to be seen, proceed to fill up the larger spots caused by the uneven surface the previous work has made. After this has been thoroughly accomplished it is usual to call the negative finished, and it is sent to the printer in that condition. No greater mistake is made than this, as will be seen by the careful student upon examination. If you possess two negatives of this class, that before retouching were considered alike, it is easily observed that smoothness has been obtained at the sacrifice of brilliancy and expression. That which was before retouching a curve of the forehead, or an indentation of the cheek, is now flat surface. The delicate shadow under the eye, on the shaded side of the face, has disappeared. The shadow under the nose had its share of freckles, and as a consequence the upper lip now looks swollen and unnatural. The mouth has lost its character,

the eyes their expression, the nose has become flattened; in short, a dull tameness pervades the whole face. To remedy these evils, the highest points of light and the darkest portions of the shadows must be rightly located, and their contrasts made as great as in the untouched negative. Even greater than this is admissible, if the original picture be flat enough to make such treatment desirable. Then we can more justly consider the negative retouched, and deliver it into the printer's hands with a better grace. In carrying out the above method, I would impress upon my readers the importance of preserving the same order of work as here given.

Our next subject to be considered will be the more diversified one of—

Copies.—Of course negatives of this class may possess any of the faults already described, and require the treatment therewith given. But the ones most frequently met with, and which I wish to dwell upon most, are those possessing no contrasts whatever; the face, drapery, background, and accessories being void of bright light or deep shadow, and possessing the same tone throughout. Of course it is not possible to make perfect negatives out of such as these; but it is possible to so improve and renovate them that their faults will be but lightly dwelt upon.

To begin, then, with a negative of this kind before us. The face, hands, and white drapery (if any there be) must first receive attention. After the surface above them is ground, their entire limits must receive the powdered crayon in the manner already described, taking care not to exceed the limits, nor to omit any portion within them. Pass the crayon stump lightly to and fro until no streaks are discernible, and the surface has received all the crayon it will contain. If very great opacity is required, pulverized blue or pink pastel is superior, as possessing a desirable colour and great body; but from that we descend to No. 3, 2, and 1 Conté Crayon, according to their degrees of opacity, the last-named being quite hard; and as but a small amount will adhere to the ground surface, it is most desirable where the picture needs but little raising of tone. After brushing away the residue we proceed with the pencil to smooth up the face, taking each feature separately, raising the light upon it as much as it will bear, and yet be a correct likeness; making the most of any little indentation of the face that helps to give an idea of its correct form, brightening the eyes, making the division lines sharper between lights and shadows; in short, bringing out the features distinctly that were but suggestions in the original. The degree to which this can be carried must be learned by experience. The beginner will be sure to overdo it, and produce an unnatural picture. But as the prints show less of this than the negatives, it follows that a little intensifying of them becomes a necessity. After working upon the face until sufficiently smooth and well defined, the hands and drapery must receive attention. The fingers must be retouched as carefully as the features of the face, and the folds and detail of dress be well brought out. Care must be observed if lace or embroidery appears about the throat, not to trace the pattern more distinctly than the features of the face, lest by contrast you should make the face seem more indistinct than before. Next the background, which in this case is supposed to be undesirable, being too light, too dark, scratchy, or too near the colour of the face, we wish to improve upon. First, entirely blot out the original background by covering the unvarnished side of the negative with an abundance of "Gihon's Opaque," using a small brush upon the outline of head and figure, and a larger one for the remaining space. Now make a print or impression of the negative upon silvered paper, cut out the figure carefully, and when a perfect print is made possessing a white background, lay this shield over the figure, and shade the remaining portions to any desired tint, remembering that the background must be darker

than the lights of the face. If it is desirable not to show the hands, a very pleasing picture can be made by vignetting the figure, besides stopping out the background. Then, if the face is too dark to look well with its white surroundings, place a movable shield over the face, head, and small portion of the figure, exposing the remaining portions to the light until shaded quite dark.

I am aware that these suggestions belong to the printer, somewhat. But as we cannot learn too much of each department of our art, my friends will pardon the digression, I trust.

A PHOTOGRAPHER'S EXPERIENCES IN THE LIBYAN DESERT.

BY PHILIPP REMELE.*

ABOUT five miles west of Gaer Dachel there was to be found the ruins of an Egyptian temple, the stones of which, so far as they were apparent, were covered with hieroglyphics in a well preserved condition. The heavy sandstone blocks of the roof had been thrown down, presumably by an earthquake, but the walls and inner spaces seemed to be passably perfect, so far as one could judge in their buried condition. Acting on M. Rohlfs's instructions, I caused this temple to be, to a great extent, cleared out between the 19th and 25th February. In this way I was enabled to execute some perfect photographs, and the reproductions of the hieroglyphics proved of especial interest to those interested in the history of Egypt.

On the 18th March we took our departure from Gaer and proceeded to the Oasis Chargeh, the journey occupying five days over a most miserable bit of desert, and here we were heartily received by Dr. Schweinfurth, who had occupied Chargeh. The celebrated temple at that place took up all my time on the following day, and I had little to spare, for our stay was limited to a couple of days. The hieroglyphics covering the whole of the walls had to be taken in portions, and a large number of plates, therefore, was necessary for the purpose. My tent, fortunately, I was able to set up in the shade, otherwise I should have had a great deal to worry me. On the following evening my task was finished, and I had secured thirty negatives. I was also fortunate in obtaining a very fine landscape picture of the oasis in the vicinity. As regards reproducing hieroglyphics in the camera, I should mention that these, in order to come out plainly in the photograph, should be illuminated diagonally. If the sunlight is reflected straight at them the markings are scarcely to be seen. That pictures such as these must be exposed for a brief while only—as in the case of engravings—is but a matter of course. In my pictures of the Chargeh temple the Egyptologists have found some interesting data.

Our last desert journey from Chargeh to Esneh on the Nile, where we arrived on the 31st March, put our patience and endurance to a hard test. The hot Charmain wind had already commenced, and had a most relaxing effect upon us, especially on the first day. The thermometer showed an atmospheric temperature of 84° Reaumur. Unfortunately, too, some of our comforts had been exhausted, and among others our stock of wine. Our camels were almost broken down, and it was only with the greatest difficulty that they pursued their laborious course.

On the 30th March we first became aware of the vicinity of the Nile from an appearance of smoke in the horizon in an easterly direction. The smoke proved to come from a sugar factory, and it was with the loudest cries of joy that we greeted this first trace of civilization. Every feeling of fatigue vanished in a moment, and all of us pressed eagerly forwards. But our goal was still a long way off, and it was not until the next evening that we arrived in sweet Esneh.

The well-known temple of Esneh is almost wholly buried, and it is only the forecourt that is exposed. By reason of the very weak illumination of the place I only secured a serviceable photograph after much trouble. I gave an exposure of twenty minutes, and the high temperature was fatal to many of my plates.

In Thebes, also, where we rested for a day on our return journey to Cairo, I was fortunate in securing some interesting pictures of relics of ancient Egyptian monuments. The great heat had, however, an injurious effect upon the photographic manipulations, and it was only after much trouble that I finally secured some good negatives. At Thebes my photographic labours ended.

The winter of 1873-4 in the Libyan Desert, as also in other parts of Egypt, was extraordinarily cold. Even in March, when the temperature is generally of a tropical nature, we had very few days of very hot weather, and it is to this circumstance that I ascribe, in great measure, the success that attended my efforts.

In very high temperatures the collodion was generally the chief source of failure. The Beyrich instantaneous collodion, which I took with me, is rich in alcohol and water; while it worked well under normal conditions, it did not dry uniformly upon the plate when the weather was very hot. The upper and thinner side of the plate became too dry before the lower and thicker margin had done draining. This, of course, gave rise to many defects, and every plate exhibited the well-known blue margin. By adding an appreciable quantity of ether to the collodion, the latter showed a good deal of improvement. The film upon the plate then set more quickly and uniformly. In this way a thinner and less sensitive film was produced, but this was a matter of minor importance. According to my experience, therefore, I should recommend the employment, in a dry, tropical climate, of a collodion containing a minimum of water, and of a quick drying ether—full nature.

In the very clear, transparent atmosphere of the Libyan Desert, the contrasts of sunshine and shadow were much more considerable than they are with us in Germany. This glaring illumination of the scene is to be found in all my pictures; it is not hardness, be it remembered, but a true reproduction of nature. A desert landscape appears to the eye of the observer exactly in the same way. As I had no photometer with me, unfortunately, I was unable to test the intensity of the light from time to time; but that it was very weak in the shadow I was able to prove when I had occasion to print some negatives at Dachel. As a rule I gave the same exposure as I should have done in Germany in summer time. The difference in temperature during the day and night had, however, a material effect, as may be readily understood when it is mentioned that the thermometer at sunrise was often -3° Reaumur, while at 2 p.m. it marked $+19^{\circ}$ R. in the shade. That cold chemicals work slowly is well known, and therefore I had to regulate the exposure not only according to the nature of the object and the way it was illuminated, but also according to the temperature at the time being. If the photographic tent stood in the sun, as was usually the case, the temperature inside was, on an average, 10° to 12° R. higher than in the open air.

Very annoying in my photographic work were the masses of flies that swarmed everywhere from the beginning of February, these insects being particularly in the way when I was attempting portraiture. My brown native models were never very clean; they all possessed a shiny and greasy appearance, and evidently had a great abhorrence to washing themselves. My models attracted the flies in numbers, these settling upon their faces, and especially about their eyes, nose, and mouth. Not only, therefore, were all sorts of grimaces made, but the people were rarely quiet during the sitting, from the insects teasing

them so. I used, therefore, to begin work as soon as possible in the morning, before the flies began to be worrisome.

The few words necessary to warn my sitters to be steady were easily learnt, and I found both men and women very docile and attentive to my instructions, keeping the eyes in the proper direction and the head steadily in the rest. Generally, however, I employed one Sheik Mohammed Daub as interpreter, for he spoke French with tolerable fluency. When the flies did not tease very much, the sitters sat quite still, and it was only the Barber of Dachel, who was so severely enjoined to be still that he became terribly frightened over the whole business, and shook ten times running, in as many pictures. When flies were very numerous, the plates had to be carefully protected in drying, for, obviously, insects walking over the film during desiccation inevitably destroy the picture.

The water at hand for use, which I obtained from the different wells and springs, was for the most part very impure, and it was only the spring at Farafrah that yielded almost pure water. The water from the Dachel Oasis contained much iron and salt. All the springs at Dachel were warm ones, the temperature of the water varying from 30° to 36° R.; and, on standing, flocculent iron matter settled down. The iron developer prepared with this water acted all right when first poured over the plate, but as soon as the image began to appear, a white cheese-like precipitate was formed, which partially adhered to the film, and could only be removed by very energetic washing. Sometimes this phenomenon was so marked that it injured the pictures. In such cases there was nothing left but to purify the water first of all with nitrate of silver. The water was mixed with a little nitrate of silver solution, sunned for a short time, and then filtered, after which it could be employed for the preparation of the developer. The operation was a very elaborate and tedious one, but it was the only way to get good results.

In the Chargeh Oasis I found most of the springs contained salt, although, singularly enough, there was in the neighbourhood of the temple a spring of very fine pure water.

The Nile water, renowned throughout the whole of Egypt for its purity—or, as the inhabitants term it, its sweetness—was after filtration found to be very suitable for the preparation of solutions. It was necessary, however, to draw the water direct from the stream itself, for that taken from canals fed by the Nile was, on the contrary, very dirty, and often contained an appreciable amount of salt in solution.

[The publication of this last portion of M. Remele's interesting diary has been delayed for some reason unknown to us, and we have been unable, therefore, to supply our readers with it before. They will be glad to hear that the Viceroy of Egypt has just presented M. Remele with the order of the Medjije, in recognition of his valuable services.—Ed. P.N.]

"TOUGHENED GLASS."—Lieutenant-General Sir Henry James writes to us as follows:—"Under this head you refer to a process by which glass is made in such a manner that it 'practically ceases to be brittle.' But there is no allusion to the account of, apparently, a similar discovery in the time of Tiberius by Pliny, Dion Cassius, and Suetonius:—'In the reign of Tiberius, it is said, a combination was devised which produced a flexible glass; but the machinery of the artist was totally destroyed, we are told, in order to prevent the value of copper, silver, and gold from becoming depreciated.'—Pliny, B. xxxvi., chap. 66. According to one account, Tiberius ordered the artist to be put to death. I hope M. Francois de la Bastie will reap the reward which the Roman artist ought to have received, instead of death."—Times.

The Photographic News.

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SHORTENING EXPOSURES.

A COMMUNICATION from Mr. Werge, which we print on another page, gives details of some interesting experiments suggested by our recent article on obtaining increased sensitiveness in the wet collodion process. Before referring to the results obtained, we may remark that we always regard with great interest, and attach considerable weight to, the experiments and results of photographers of such standing and experience as Mr. Werge—one of the early portraitists, who has passed through the entire curriculum of photography, from the Daguerreotype downwards; one who, whilst steadily working in the recognized practical paths as a professional photographer, has always had a keen love of exploring the diverse side-paths as an experimentalist, being familiar, practically, probably, with every process and modification which has been suggested in the art, and who now, in devoting some time to photography, brings to bear the habits and experience of a professional photographer and the zest of an amateur. We make these preliminary remarks because the calibre of the experimentalists materially qualifies the value of the experiment, and we regard such work from such men with especial favour.

Mr. Werge sends us examples and details of experiences in two of the directions to which we referred in our recent article: the use of diffused light as an accelerator, and the use of nitrate of uranium in the nitrate bath for the same purpose. We will take the latter first. From the experiences of Captain Abney and Colonel Stuart Wortley, and our knowledge of the behaviour of the uranium salt under other circumstances, we were led to hope that a valuable accelerating agent was available for photographers, and to urge its further trial. In Mr. Werge's hands the result is miserably disappointing, nor is the result deduced from one hasty series of experiments. The attempt to utilize nitrate of uranium in this way is not new with Mr. Werge. He has before worked in the same direction, always with the same results. The revival of the suggestion induced him once more to repeat the experiments, and he sends us details and examples of the results. Nothing could be fairer than the mode of conducting the experiments; nothing, apparently, more conclusive than the results. A plate was coated with a collodion of known sensitive character, and, after coating, divided in the middle: one half being then sensitized in ordinary silver bath in good condition, and the other half in a new silver bath to which nitrate of uranium was added in the proportion of ten grains to each ounce. They were then exposed simultaneously under the same conditions, and developed in similar manner. The half excited in the ordinary silver bath yields a good, well-exposed picture; that excited in the uranium-treated bath is hopelessly

under-done, certainly not half enough, probably not one-fourth, in effect, as much exposed as the other half. The experiment was repeated, substituting a new unsophisticated silver bath for comparison with the new one containing the uranium salt. In this case the discrepancy in exposure does not appear to be quite so great: the bath with uranium yields a poor, under-done negative, whilst the new bath without addition yields a fine, well-exposed picture. In a third experiment the old bath, in good condition, was tested against a portion of the same solution with nitrate of uranium added. The contrast here is as great as in the first experiment: the old bath gives a good well-exposed negative, whilst the portion of it which has been treated with uranium is a miserable failure, under-done beyond estimating.

Now, here is a perplexing paradox! Two gentlemen so experienced and able, both as practical photographers and experimentalists, as Captain Abney and Colonel Wortley, find the addition of nitrate of uranium to the silver bath a decidedly accelerating agency. Mr. Werge, as able and experienced, finds it not only not an accelerator, but an unmistakable and serious retarder. That each of the gentlemen named has obtained the results described there cannot be a question; and as no result can arise without a cause, there must be, in some part of the operations, a serious variation in the conditions. What it may be we cannot at this moment suggest; but we may illustrate by reference to an analogous case. The addition of nitric acid to the silver bath was for many years regarded as having a seriously retarding effect; and so it doubtless had under the conditions in which it was employed: that was, with a simply iodized collodion. With the free use of bromides in the collodion, nitric acid is not only not a retarder, but, under some circumstances, possesses actually an accelerating effect. It becomes important, then, to note in what points the conditions of working in the case of Colonel Wortley and Captain Abney vary from those of Mr. Werge, in order to account for the discrepant results recorded. That some variation exists we assume as certain; and we are only plentifully declaring the thing as it is in insisting upon it. Nothing could, perhaps, better justify Colonel Wortley's call for experimenting committees than the results to which we have been calling attention. Half a dozen capable gentlemen testing, first separately and then together, would more readily trace the causes of such discrepant results than half a hundred working independently and without confederation.

The definite confirmation which Mr. Werge is able to afford of the advantages of supplemental lighting is as satisfactory as the uranium results are perplexing. The use of diffused light to supplement an enforced curtailment of the exposure proper, whether from movement of the sitter or other cause, seems to possess advantages over pre-lighting, on the ground that it is more often required to compensate for such curtailment, than as an addition in case of premeditated curtailment; otherwise we think that on theoretical grounds pre-lighting is preferable to after-lighting. But this is a point which might be definitely determined by a committee of capable men, if such could be induced to undertake an examination of all the methods proposed of late years for reducing exposure. Failing this, the special effort of individuals in testing methods and recording results, in manner similar to Mr. Werge, will form most important contributions to a final settlement of many questions of vital interest in the progress of the art.

ASPHALTE AND BITUMEN IN PHOTOGRAPHS.

THE use of bitumen of Judæa in producing photographic prints has almost passed out of notice amongst photographers. As, however, the question has more than once recently been raised by correspondents as to whether the process had not sufficient claims for more general practice, it may interest some of our readers to be reminded of the

treacherous character of bitumen as a pigment. The *Athenæum* says:—

"An artist of distinction expresses his surprise at learning the other day from his colourman that the old practice of using that extremely fallacious pigment, asphaltum, is not only not discontinued by painters, but is as common as ever. We are compelled to endorse the remarks of our informant on this subject, for all who visit the public collections of paintings are well aware that irreparable and constantly increasing mischief has attended the employment of asphaltum. A large proportion of Wilkie's later productions have been ruined by abuse of the facilities which attend the use of asphaltum. The material, unlike most other pigments, seems never at rest, for a slight increase of temperature induces a state approaching liquefaction; and this occurs again and again, separating the material from its neighbours, to the ruin of both. Decrease of temperature, on the other hand, causes it to shrink, and ultimately it appears to shrivel to a condition approaching dryness, and it is then apt to part from the canvas on which it has been placed. The results are obvious in such pictures as Hilton's 'Sir Calpeine rescuing Serena,' one of the artist's best works, formerly shown in the National Gallery; and many people may remember that one of Serena's eyes slipped over the cheek below it. The picture had to be turned upside down till the wandering eye slipped back again. One of Newton's pictures in the collection of the Duke of Devonshire is in a disastrous state owing to this cause; it is cracked all over. Nor does the injurious pigment retain its original colour: it becomes rusty as it deteriorates in other respects. Several of Reynolds's sitters are said to have contracted with him that only permanent pigments should be used in their portraits. We suggest that picture-buyers should imitate Reynolds's employers in this matter, and covenant that their purchases should be innocent of the bad material, otherwise their investments may, in a few years, be valueless."

UTILIZATION OF RESIDUES.

BY PHOTO-CHEMICUS.

In the following remarks on the above subject, so important to photographers, we wish, at the onset, to deprecate all criticism from a *scientific* standpoint.

To those who possess even a moderate amount of chemical knowledge, these observations will be useless. We are not going to write anything that is not already well known, but our object is to explain a few chemical facts in as simple a manner as possible; to show their practical importance and value to that numerous class of hard-working, practical photographers whose time is so absorbed by their every-day work that they have none to spare for the acquisition of chemical knowledge; and if they find, as we trust they will, that a little careful attention to our details will effect for them a considerable pecuniary saving, our aim will have been fully accomplished.

Without further preface, we commence by pointing out that the order of silver waste in photography is as follows:—

- 1st. The development of the negative.
- 2nd. Fixing it by dissolving out the free iodide of silver.
- 3rd. Washing the prints.

And, lastly, fixing them.

It may facilitate our explanation if we commence with the simplest case of all, and deal first with the chloride of silver obtained from the process of print washing.

Now, the first and most important point we wish to explain to our readers is one of the fundamental laws of chemistry, viz., that all simple bodies—or, as they are called, *elements*—have a remarkable peculiarity, which is that they unite to form compounds in certain unalterable and fixed proportions. It is unnecessary to explain this theoretically, but we will give a practical illustration of

it in the case of the metal silver of which we are now treating. For the sake of brevity we must ask that our figures be taken for granted.

Silver, then, is said chemically to have a weight or combining number of 108; chlorine of 35½; sulphur, 16; iron 28. Now we can show our meaning so as to be easily understood. Let us take the case of the process of washing a print. The milky water is poured into a bottle and some salt is added, and the result is that a white curdy substance falls to the bottom. Why does this occur? In this way:—The washing water contains free nitrate of silver; the salt is composed of chloride of sodium. Now, when these two substances are mixed, the result is no longer nitrate of silver and chloride of sodium, but a change takes place, and we find it to be *nitrate* of soda and *chloride* of silver; which latter, being insoluble, falls to the bottom.

Now for the lesson we wish to impress. This chloride of silver has a fixed constitution. It is always the same; no matter whether too much or too little salt has been added, no matter whether it be summer or winter, whether the water be dirty or clean, hot or cold, the resulting chloride is the same, and consists of 108 parts of pure silver and 35½ of chlorine; that is, in round numbers, three-fourths of its weight will be pure silver, and the photographer who deals separately with his print-washing should get approximately this value. If the return do not amount to at least two-thirds, either he has not received the value, or he has allowed it to become mixed with some less valuable material. But by a very simple process any photographer who chooses to take the slight trouble involved in keeping his print washings separately from the other waste need not be at the mercy of the refiner. If he will simply keep a jar or cask containing a pound or two of scrap zinc, and a tap at about one-fourth from its bottom, and run off the clear water by this tap after it has rested all night, he will at length find a considerable quantity of black powder at the bottom, which will be absolutely pure silver, but somewhat contaminated by the zinc. Let this at intervals be carefully collected and soaked for a few hours in a mixture of oil of vitriol one part, water nine parts; and the remainder can be either converted into nitrate of silver, or fused into the metallic state, or sold at its actual value. The total cost of recovering ten ounces of silver by this method ought not to amount to more than one shilling.

One or two cautions may be advisable.

1st. In pouring off the clear water from the jar or barrel, it will be well to test it occasionally by adding two or three drops of solution of salt to a tumbler-full of the water. If this should turn milky, the conversion of the chloride into metal is not complete, and the vessel should be shaken, or its contents stirred, and again left at rest for a day or two.

2nd. Under no circumstances should any fixing agent, either cyanide or hypo, be allowed to mix with this or any other residues, but they should be kept and treated separately, as these agents dissolve the chloride freely, and are not to be separated in so advantageous a manner. This process is also the best for recovering the metal from an old bath, and with ordinary care the actual loss is almost inappreciable, while the resulting metal is practically absolutely pure.

In our next we shall treat of the developing and fixing wastes.

A CELESTIAL STUDIO.

BY D. K. GRIFFITH.

Shanghai.

It must not be surmised, from the title of these notes, that they will embody any heavenly vision, or conjure up for the amusement of the reader a fairy dream-land. With this short prelude to what is matter of fact, I will

introduce you to a China-man's studio in the "Far East." There is a staircase to ascend, and you are at once in the reception rooms, adorned by a few dilapidated cane chairs, a circular Ningpo table, a glass case containing a small assortment of very old portrait cases and frames of the cheapest kind; a mirror of common glass is suspended over the dirty mantelshelf, and reflects your visage in the most grotesque style; effigies of sundry grim China-men and imbecile looking foreigners garnish the walls, and hang published libels of the art appealing to public justice against the growing depravity of photography, and seeming to wonder how long their spirit of patience is to be tried. But the visitor's mind is utterly lost in astonishment while contemplating the heterogeneous display of coloured wonders. Miserably vague would my efforts be to describe their amazing effect upon the artistic visitor, nor shall I attempt it, so please to draw upon the fund of your own imagination. Nor is English literature overlooked, as we find a London Directory for the year 1840, which the enterprising proprietor has recently purchased at auction, and after a hard contest succeeded in securing for t/s. 6* (or about £2), which, considering its size, seemed cheap.

So much greed and love of squeeze† is ingrafted in the China-man's nature, that it is not possible for him to lavish or even expend the necessary outlay in the fitting out of his premises. A China-man, when buying, must buy cheap, or at least something under the market prices, to feel satisfied with his purchase. Saving a few cents is to him an object of greater importance than good material, and hence, in the entire arrangement of his studio, the accessories, and apparatus, a too plainly perceptible cheap style pervades, and, in consequence, their studios are but little encouraged by resident foreigners, their only patrons being sailors from foreign ships in harbour, or occasionally a foreign merchant's clerk sitting for a "spree." Indeed, so exclusive is their business with sailors, that the "artist" will ask the question, "What ship you belong?"—if you "belong" captain or engineer?—or "belong chief sailor man"?

Many of them do a very good business, and, with the natural characteristics of China-men, plod on with praiseworthy perseverance, imitating their more able and better-supplied foreign brothers in every little novelty that may appear from time to time; and often those efforts are very grotesque.

The native artist has little support from his countrymen, and from this cause none are to be found away from foreign settlements. Some few enterprising Cantonese have tried to push business in a few of the large towns of the interior, but were obliged to withdraw, from the hostility of the natives, who display their repugnance of the art by various petty annoyances upon all occasions, sometimes resulting in serious consequences and danger of life. In my own case I have had my chair torn to pieces on the road, my coolies beaten, and my camera broken; but, owing to the wholesome dread of a foreigner entertained by the natives, I happily escaped with only a display of stone-throwing; in the case of a China-man he would have fared much worse. This unfortunate hostility to photographic manipulations is due to a strange belief, which it is impossible to eradicate, that the photographic image is the soul of the original, the withdrawal of which from the body very naturally producing death. This tragic end may not take place for a month or more, but I have heard two years given as the longest time the photographed vicem can exist. Some few are to be found who avail themselves of the art, and indulge in a portrait of themselves batheir family. In this case, great are the preparations bat the sitting. Their number one (best) clothes are dispatched by a coolie; they are put on in the studio with much care and more talk; the victim seats himself, spread-

ing his robe out to the best advantage; he will have a snuff-bottle in one hand, and a fan in the other. A direct front face must be taken, so as to show both his ears, and each side of his face of the same proportions; both feet must be so arranged that they are of equal length, perspective being no reasoning power with a China-man. The hands are next arranged so as, if possible, to show each finger distinctly. If they are blessed with a fancy long nail or two, great is their delight to see them well brought out in the portrait. They will to a certainty have some flowers with them, and a small vase to be placed on a table, or in some cases a French clock is the pride of their hearts, and is to be placed close beside them. Everything being carefully arranged with the assistance of three or four friends, he pronounces the emphatic words, "Can do! Wanté largé." If the sitter and the artist are natives of different provinces, the conversation is conducted through the medium of an interpreter; or if both are familiar with "Pidgen" English, it is carried on in that peculiar idiom. For illustration and convenience we will conduct it in the latter way.

During the considerable time occupied in the sitter's preliminary toilet operations, the artist has been consoling himself, and pondering possible profit, comfortably reposing on a Singapore reclining chair, with his pipe and fan. The China-boy† approaches, when the learned professor of the black art extends himself at greater length, and comes out with the expressive words "What thing?" The boy explains that the sitter is ready for him, when he very leisurely places down his pipe, rises slowly, and with cat-like steps he enters and confronts his visitor. Both bend low in the characteristic salaam, meeting their hands together as required by their etiquette. A short altercation then begins as to which of them is to reseat himself first. At length their politeness decides that both are to be seated at the same time, cups of tea are brought, and each takes the same number of sips. Their introduction being gone through, business commences by the artist putting the quaint question:

"How fashion you wante that picture? Wanté liké liké, or number one handsome?"

The uninitiated in "Pidgen English" is to understand that he desires to know if the sitter requires a nice picture, got up regardless of expense, or the more unpretending one of himself; people sitting are privileged to have their choice. The gentleman in this case, we will suppose, desiring the latter, the artist rises, and prepares a glass. The interval is usually filled up by questions of so personal a nature as to be most offensive to foreign ears, but with them perfectly decorous, and in accordance with the "rites."

The portrait taken, the "artist" returns with the satisfactory announcement that it is "number one," and "too muché liké." In the language of the place the sitter asks him to "pay my look see." But firmly, though politely, the "artist" declines by the admonishing phrase: "My no can suppose you spoilém he."

This being considered conclusive, the delicate question is asked: "How much cost twelve piecé?"

Artist.—"Five dollar can do."

Victim.—"My think five dollar belong too muché."

Artist.—"How fashion belong too muché? You pay my all the same other piecé man. My no wanté squeeze you one cash.‡ Suppose my squeeze you, my must lose facé\$, and every man savey|| my do pidgen that fashion. No, my talké true; five dollar belong custom."

All being eventually settled agreeable to their mutual

* "Pidgen"—work, business, or any employment.

† The usual term applied by foreign residents to denote an attendant or a body servant.

‡ "Cash"—a small copper coin, with a square hole in the centre for the purpose of stringing them together; 1,200 is their average for one Mexican dollar.

|| Lose his reputation for honest dealing.

|| "Savy," to know.

† Tael varies in value, the average in Shanghai being six shillings.

‡ A term applied to all cases of petty larceny or swindling.

satisfaction, the sitter again changes his clothes, and passing by printing-frames and sundry other photographic paraphernalia, with a parting salaam he regains the street, and entering his sedan chair goes on his way rejoicing

DR. VOGEL AND THE ENGLISH ECLIPSE EXPEDITION.*

OUR prospects are not brilliant. Since we have been in the Indian Ocean the weather has never ceased to be cloudy, and even when the clouds break up, the heavens do not appear blue, but veiled, so that the photographic action of the direct sun is unfavourable, though I had, owing to the height of the sun, anticipated the reverse would be the case. Still more gloomy are affairs connected with the instruments. My invitation came from England, and I was informed that instruments would be placed at my disposal. Judge of my surprise, therefore, when, on unpacking, I found nothing at my service but mere playthings. In the first place, I have no telescope, but only an ordinary six-inch lens, endowed with an awful focal difference, and without a camera. This lens, which is upon a stand, is to throw an image of the sun by means of a mirror which receives the sun's rays. The sun, however, is in motion, and the mirror ought, therefore, to be able to follow its path, if the image is to remain reflected upon one spot, which is a matter of course in photography. The mirror ought, therefore, to be provided with a clockwork movement; but there is none fitted to it. My assistant is to turn the instrument, it appears, and is to practise so as to do it accurately.

Really one hardly knows what to think when one looks at the preparations that have been made. The two members of the expedition from England have, of course, provided themselves better; they have telescopes with clockwork and all kinds of perfections such as are necessary to the successful accomplishment of the difficult task we have in hand. I compare myself to the stork, in *Æsop's* fables, that is invited to dinner by the fox, and finds itself unable to eat the broth set before him, in a flat dish, with his long beak, while the fox licks away at the repast with undivided pleasure. So it may happen that my English friends, who have learnt from my writings how to photograph a spectrum, will be successful, while I may prove unfortunate. Unluckily, I shall be unable, like the stork, to have my revenge.

My only hope is that the Indian observers may have a telescope at my disposal, or that I may be able to borrow one from the German Transit of Venus Expedition, and for this reason I have telegraphed to Singapore, where the party is now occupied in making longitudinal observations. The stupidity of the whole business is that the Astronomer-Royal in London possesses a suitable telescope, but he would not allow the same to be sent out, as the expedition is undertaken without his sanction.

I am already beginning to feel the effects of the tropical climate, the fearful heat, and the vapour-bath atmosphere. The sleep at night is quite a *tour de main*. Unfortunately, too, there are a great many ladies on board, and for this reason we are much inconvenienced. During my first voyage there was not a single fair passenger, and we slept on deck, on the table of the saloon, or anywhere else we chose.

To-morrow we arrive at Ceylon. For the first time I shall see tropical vegetation. We shall remain three weeks in the Nicobar Islands, and then proceed to Calcutta. Captain Waterhouse, of Calcutta, will be one of the observers. It will be a pleasure to meet him, as I know him personally, and he speaks German. Another gentleman, a member of the Berlin Society, M. Schirmer, I shall also have the pleasure of visiting. I hope to meet M. Eschke returning from the Transit of Venus Expedi-

tion, and if so, I shall take him with me as my assistant, for I have already permission to do so.

I think of remaining in India to the end of May, and returning to Europe in June.

I hope to bring some interesting pictures from Aden and India, which I shall purchase rather than take. In Aden very fine photographs 8 by 10 inches, mounted, can be purchased for a rupee; and at Suez the same may be had for a mark. The sale of unmounted prints is very much in vogue, and I think the custom would become popular in Germany. The photographer saves the expensive cardboard, which, if the print decays, is always lost; while the purchaser can roll up and transport his property more easily, and have it mounted as he likes. When it is borne in mind that the cardboard often costs as much as the picture, the matter becomes one worthy of consideration. The tearing of unmounted prints is easily avoided by the seller; pictures of the same kind are placed in a heap, and covered with a thick glass plate. In this way every purchaser could see them without touching, and we know how many pictures are spoilt by dirty fingers.

On board the *Baroda*, before Ceylon, March 14th, 1875.

Correspondence.

ANOTHER PHOTO-RELIEF PROCESS.

SIR,—In your issue of the 21st I see a patent has been taken out in the land of the Stars and Stripes for a new photo-relief process. It may not now be out of place to give the outline of another and more valuable one worked out, I believe, by myself; it is as follows:—A transparency is coated with chromatised gelatine, and exposed to the light, the result being a relief in gelatine, the lights of which are represented by elevations, and the shadows by depressions. This relief is subsequently hardened, so as to stand a fair amount of usage in printing. How the film is so hardened it is not my intention to particularly describe at present; sufficient is it to say metallic substances are deposited in the body of the gelatine, and means taken to prevent the swelling of the gelatine printing surface by materials repellent of water.

Those of your readers who may be acquainted with the Woodbury method will see many advantages in the above outline of a modification thereof.

I merely write this to prevent anyone placing restrictions on the profession by patenting that which is now sufficiently indicated to prevent the possibility of it, and which ultimately shall, so far as I am concerned, be freely placed in the hands of those who may be inclined to use it.—

Yours truly,

W. E. BATHO.

Halifax, May 22nd.

SUPPLEMENTARY LIGHTING, AND URANIUM IN THE BATH.

DEAR SIR,—The remarks in your leader of last week, on "Uranium and other aids to increased sensitiveness in the wet process," induces me to forward you the enclosed evidence of the advantages of supplementary lighting. As you will see marked on the print, the simultaneous exposure with twin lenses has three seconds with a supplementary exposure of three seconds more on one of the pictures. You will easily distinguish the one from the other, and observe the immense gain in *detail, density, and delicacy*. In short, the one is a useless negative, and the other is a usable one.

I always was, and am yet, a believer in the desirability of giving the proper amount of exposure through the lens to obtain the best results, and was consequently for a long time a sceptic in the advantages to be derived from either preliminary or subsequent exposure. Mr. Foxlee took great pains to make me a convert to supplementary exposure, and I thought I was converted, but as all my

* *Photographische Mittheilungen.*

experiments in the winter months gave me more fog than increase of detail, I became a backslider, and relapsed into my old ways.

Short exposures are of great importance to me, for I make the difficulties of grouping and posing children my recreation. I employ the quickest lenses I can buy, and endeavour to have and keep my collodion, bath, and developer in the very best condition; but notwithstanding all these advantages I sometimes find that simple exposure under the most favourable conditions is not sufficient. It was only the other day I required five seconds to obtain a good picture, but my sitter was too restless to give me more than two seconds sitting. By after exposure I made up the deficiency, and obtained a usable negative thereby. This induced me to make further experiments, and I am now thoroughly convinced of the efficacy of supplementary exposure, and I consider that subsequent lighting by any of the previously described methods is the best, perhaps the simplest, and one that involves neither outlay for new apparatus, nor loss of time in the one that I employ, which is simply to hold a piece of white blotting paper, or filter paper, before the lens, close to the hood, immediately after exposing on the sitter.

I do not think it probable that either the optician or chemist can reduce the ratio of rapidity to fifty per cent., or two-fifths, which light alone really does; and I would recommend all those who are anxious or find it necessary to work rapidly, to try after-exposure by the simple, ready, and inexpensive means I have described. I recommend subsequent exposure for the following reasons.

First, obtain the proper amount of exposure through the lens if possible.

Secondly, if you do not obtain the right exposure from the sitter, resort to subsequent exposure to supply the deficiency.

Thus, if five seconds are required to obtain a good result, and only three are given by the sitter, take diffused light for the other two, and so on, regulating the time of the subsequent exposure according to the time obtained from the sitter. I have generally found that the best results were obtained by giving about two-fifths of subsequent exposure, though as much as one hundred per cent. may be given with safety in cases of very short exposures on the sitter.

Nitrate of uranium in the nitrate of silver bath, as recommended by Col. Stuart Wortley, is *not* an accelerator. I have made countless experiments with nitrate of uranium in various solutions and emulsions, and have always found it a great deal slower than the silver salts in all forms, and a retardant. As in the cases of the addition of nitrate of uranium to the silver printing bath and collodion, so it is in the silver sensitising bath for negatives, the very reverse of an accelerator. Every grain of nitrate of uranium added to the exciting bath of nitrate of silver makes it more and more insensitive. It is years since I satisfied my own mind on this point, but I have recently made careful and impartial experiments, and send you the results, that you may satisfy yourself and your readers on that subject.

The examples sent herewith are all numbered and described on their faces, but I will here give you a detailed account of the manner in which I made my experiments, and I think you will admit that it would scarcely be possible to make any experiment of a comparative character in a fairer or more convincing manner.

First, I coated a plate with a known sensitive collodion, cut the plate in two afterwards, and excited one half in a known sensitive silver bath. The other half was excited in a new nitrate of silver bath with ten grains per ounce of nitrate of uranium added. Both halves were simultaneously exposed and developed.

Result of No. 1 experiment—The uranium half as many times under exposed.

Secondly, I treated a plate in the same manner, and excited one half in a new nitrate of silver bath, and excited the other half in a portion of the same silver bath with ten

grains per ounce of nitrate of uranium added. Both halves were exposed and developed at once as before.

Result of experiment No. 2—The uranium half still very much under-exposed, though the difference is not so great as in experiment No. 1.

Thirdly, I took a portion of my regular working bath, which was in excellent condition, and added ten grains per ounce of nitrate of uranium to it. Coated a plate with the same collodion, cut it, and excited one half in the silver bath, and the other half in the urano-nitrate of silver bath. Exposed and developed simultaneously as before.

Result of experiment No. 3—Urano-nitrate half vastly under-exposed, and the fallacy of the uranium accelerating theory fully exposed. In all the exposures the time given was ten seconds in a north but somewhat variable light, but that does not damage the results of the experiments, for in all cases each pair was treated exactly the same, and the results are in all cases immensely against the addition of uranium to the nitrate of silver bath as an accelerator.—I remain, dear sir, yours truly,

J. WREGS.

MR. SAWYER'S DOUBLE TRANSFER PATENT.

SIR,—I have just read in your journal of April 30th the conclusion of Mr. Sawyer's paper, respecting his new double transfer medium, and I notice that he does not say that he coats his single transfer paper with plain gelatine previous to applying the lac solution, as Mr. Spiller says in his paper that he (Mr. Sawyer) does. I have used since last October, for double transfer, single transfer paper coated with a solution of lac in ammonia. I did not think of any one patenting such an article, or should have published it in your journal. I see Mr. Spiller gives Mr. Johnson the credit of introducing reversed negatives. He must be mistaken, for Mr. Johnson certainly never claimed it himself, and he would if he had brought it out.—Yours respectfully,

E. H. D.

Boston, U. S.

[Mr. Sawyer's patent is not for the use simply of paper prepared with lac dissolved in ammonia, which was used many years ago by Mr. Johnson, but for double transfer upon a flexible impermeable support with an elastic surface. The use of reversed negatives is very old.—Ed.]

A BATCH OF QUERIES.

DEAR SIR,—Your advice on the following will oblige:—

1. Will "rice-floor paste" do for mounting C.D.V's? If not, why not? I have heard that it is the best article to use for pasting paper work. It is nearly transparent, and, I fancy, will not turn sour so soon as other pastes.

2. I have always found my worn-out gold bath work well if I put the prints in without washing them in the usual way; while if I washed them first the bath would not tone at all. The pictures do not look so bright as they do when previously washed. What is the cause?

3. When I use nitrate of baryta in the negative baths, I find all the negatives, after fixing, look as if they still retained a trace of iodide of silver. A decided blue tinge appears when they are viewed slanting; but when viewed straight through, they appear as usual. What is the reason? Can (and ought) it be remedied, and how? Is it hurtful to negative in any way?

4. Is the following "wrinkle" known to photographers? If not, then it originates with me. To the sensitising bath (of twenty ounces) add a table-spoonful of whitening, and, when going to use the bath, shake it well up, and pour whitening and all into the dish. In a few seconds the whitening settles to the bottom, leaving the solution clear as pure water. Float paper as usual, and return bath to bottle in same manner as poured out. Bath is always neutral, never discolours, never requires filtering. The whitening clears it of all impurities. Add fresh whitening when you add fresh silver.

OWN IN THE TRADE.

[1. Yes: as well as any paste.

2. Immersing prints in the toning bath without washing is somewhat wasteful of gold; but it facilitates toning very materially, as the nitrate of silver readily facilitates the separation of gold and chlorine required in the toning process. If washed prints, however, refuse to tone at all, there is something wrong in the condition of your toning bath.

3. When nitrate of baryta is present in the silver bath, a slight deposit of sulphate of baryta is thrown down on the film on developing with sulphate of iron, which gives the slight grey veil. This is no longer visible after the negative is varnished.

4. The term *whiting* is rather indefinite, as it is in common parlance frequently applied to different things. It is, however, generally carbonate of lime. The results described by our correspondent are generally produced by kaolin.—Ed.]

Proceedings of Societies.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Monday, the 3rd instant, Mr. J. W. GOUGH, President, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. G. SUTCLIFFE, Bradford, was elected a member.

There being no further business on the paper the question-box was opened, and the first question to hand—"How does the half-holiday affect the business of those photographers who now enjoy it?"—was laid before the meeting for discussion.

The CHAIRMAN remarked that as the Bradford photographers had tried the experiment, the meeting would doubtless be glad to hear the result of the trial.

Mr. RUSHFORTH stated that, so far from the practice deteriorating his business, he believed it to be a decided advantage. He himself invariably closed and went into the country, returning to his work the next day with greater zest, and he believed he had not lost any customers by it, as they all came on some other occasion.

Mr. GUNSTONE said they had found it to work satisfactorily, and were not aware of the slightest diminution of business. He would be extremely sorry were the half-holiday discontinued.

Mr. THOMPSON also spoke in favour of the movement.

Mr. WORMALD was of opinion that, if the holiday were granted, the operators thus benefited should make up the time on another occasion, though the average number of hours worked in a week should be taken into consideration. If a man came at ten and gave up work at four he could not see the necessity for the holiday in such a case.

Mr. BROADHEAD fully recognised the necessity for the weekly half-holiday, and said that, although it was not a custom in Leeds, he had found it to his advantage to give each of his assistants a half-day weekly, though he did not close his place of business, but allowed each of the assistants the vacation on a different day. If, however, the Leeds photographers should arrange to close their respective places of business on one particular day he would gladly coincide with the arrangement.

Mr. HOLGATE (referring to a remark of Mr. Wormald's) said that an out-door operator did not require the holiday so urgently as the indoor workman. For the man spending the greater part of his time amongst the deleterious vapours of the dark room a little fresh air and recreation became a prime necessity. For his own part he should like to advocate closing for the whole day, as with most photographers comparatively little business was done except preparing for the afternoon's work, and a half-day was too short a time to go any distance. He should very much like to see the holiday an accomplished fact among the profession.

Mr. WORMALD considered it was not necessary for a man to travel a great distance to enjoy a holiday or derive benefit from it. If a man had a garden and would dig in it an hour or two it would do him as much good as a long excursion.

The SECRETARY, on behalf of an establishment with which he had been connected, said the system had proved highly successful. Patrons had often come in just at closing time, but

when the matter was properly represented to them, they cheerfully acquiesced in the request to come another time.

Mr. BATHO entirely approved of the movement, quoting the saying, "All work and no play makes Jack a dull boy." If they wished a man to produce good work the holiday would have a decidedly beneficial effect, as there could be no doubt that if a man were overworked the quality of his work would proportionately deteriorate. If all photographers would combine, and unanimously decide to close their respective places of business on a given day, the matter would be easily managed; and when the public became aware of the custom they would accede to it.

Mr. HOLGATE suggested the advisability, as far as possible, of photographers avoiding having their holiday on the days when other trades had theirs, so as to afford the assistants on their holiday an opportunity of visiting the photographer's studio.

The CHAIRMAN suggested that as the meeting appeared to be unanimously in favour of the movement being set on foot, it might be advisable to appoint a committee for each town represented by the Society, such committee to consist of a principal and an operator, who should call upon the other members of the profession and solicit their concurrence.

The SECRETARY said the movement in Bradford had been carried out in a similar manner. A member of one of the leading firms in the town called upon two or three of the other photographers to ascertain their opinion on the matter and they all being in favour of the movement formed themselves into a committee, and called on the various other members of the profession requesting their co-operation, and the scheme met with so much approval that there was not to his (the Secretary's) knowledge one dissentient voice.

Seeing this question could not be definitely settled it was resolved, on the motion of Mr. Bulmer, seconded by Mr. Batho, that the discussion should be postponed, several of the members promising to see the others who were not present, and ascertain their opinion on the matter.

The next question taken from the box was—"Has any member tried bichromated glue for lining a bath?"

The CHAIRMAN said that, chrome alum not being readily obtainable, he had used ordinary alum, and found the dish perfectly waterproof, but the bath solution was much disorganised.

A MEMBER said he had used a bath lined with wax dissolved in benzole, but had found it too brittle, as it left the dish in small flakes.

Mr. BULMER suggested that a little india-rubber dissolved along with it would have a tendency to make it less brittle.

The CHAIRMAN had tried the last-mentioned method. He found the rubber solution did not spread evenly, but rose up in small lumps.

Mr. WORMALD said the best composition he had been able to find for the purpose was shellac dissolved in methylated spirit. When dry it absolutely repelled the solution. His method of using it was to have dishes made of cedar, which, owing to its lightness, he preferred to any other wood. He warmed them, coated them well with solid paraffine until the wood had absorbed a considerable quantity, and then gave them two or three coats of shellac. He had followed that plan for some time, and found it every way satisfactory.

Mr. BATHO inquired if Mr. Wormald had found the bath solution to have any effect upon the shellac. He thought the ether contained in it might exercise some solvent action.

Mr. WORMALD had not found any deleterious effect arising from any such action. In his opinion the quantity was so small as to have no effect.

After some further desultory conversation,

Mr. ROGERSON inquired if any member had had any experience in toning transparencies with platinum or iridium salts. He had experimented with them both before and after fixing, each method giving very different results; but he had not been able to secure the fine brown tones seen in some of the commercial slides.

Mr. BATHO said the platonic chloride should be neutralised with carbonate of soda, as the presence of hydrochloric acid prevented the toning action.

No other subject being brought forward, it was decided, on the motion of Mr. Holgate, that the Society should hold its first out-door meeting, in Bolton Woods, on the 26th inst., and the meeting was adjourned.

Talk in the Studio.

DISPUTED PHOTOGRAPHIC PARTNERSHIP: WHAITE v. MONTE.—At the Bloomsbury County Court this case was heard before Mr. Judge Russell, on the 22nd inst., in which the plaintiff, described as a photographer carrying on business at 56, High Street, Camden Town, sued the defendant, a photographer of Wood Green, to recover compensation for an alleged breach of contract, and for the value of some negatives and other articles detained by the defendant. Mr. Willis appeared for the plaintiff, Mr. Harris for the defence. The plaintiff said in January, 1876, he was a tenant of the defendant's, and owed him £38 arrears of rent, in consequence of which the defendant purchased various articles amounting to £21, and received from the plaintiff an IOU for £12, the balance due. The plaintiff further stated that when he proposed to set up in business for himself, the defendant offered that if he would bring his own connection, and devote his whole time to the business in High Street, he would take the plaintiff into partnership; and in consequence, on the 15th of January, 1875, he entered upon this arrangement with the defendant. The plaintiff said that as he traded under the name of Russell, he had, with the defendant's consent, the names of Monte and Russell printed upon cards, and also had the receipts printed in their joint names. The plaintiff admitted, in cross-examination, that he never paid any of the local rates or taxes during the nine months he had been at the defendant's establishment. Miss Emily Taylor stated that she was engaged by the defendant to receive customers, keep the books and cash, and her instructions were, after paying all trade expenses, to pay over to the plaintiff a moiety of the nett receipts. Mr. Harris urged that as the plaintiff had failed to prove the existence of a partnership, there could be no case for compensation against the defendant. The defendant said that the plaintiff was formerly his tenant, but in consequence of his being in arrears of rent, he offered to take part of the plaintiff's goods, together with the IOU, in satisfaction. Subsequently the plaintiff proposed to establish a number of portrait clubs, when it was agreed between both parties that the defendant should pay all the working expenses and divide the nett profits between them; but that if the speculation proved a failure, the arrangement could be terminated at once. The defendant said he was not aware of any cards or receipts being printed in their joint names till just before the plaintiff left, and that when he was dissatisfied with the plaintiff's conduct he removed all the negatives and printing materials to his other establishment at Wood Green. The defendant further said his only object in entering into this arrangement with the plaintiff was that of rendering him some assistance, as the plaintiff was in needy circumstances and out of employment at the time. Miss Taylor, being recalled, said she had no idea of the existence of a partnership between the parties, and always looked to the defendant for her salary. Mr. Harris having addressed the Court, the judge said he would reserve judgment for a week, and eventually gave judgment for defendant, with costs.

PHOTOGRAPHY OF THE ELECTRIC SPARK.—Mr. Leo Daft, photographer, of Troy, N. Y., a gentleman whose name seems familiar to us as at one time a photographer in this country, has sent the *Scientific American* several photo stereotypes, recently made, of electric discharges between the terminals of the Holtz static electrical machines. In some of the examples the picture shows the electrical flow divided into ten streams, which have the appearance of ten fine, white, zigzag wires, sharply defined, and arranged in the form of an elliptical framework. It is probable that the metals used in the terminals had something to do in giving the remarkable actinic power to the sparks which these photo impressions indicate. Mr. Daft intends to continue his photo-electrical experiments, which are certainly very interesting.

ASSAULTING A PHOTOGRAPHER.—Sergeant Verrall, of the East Sussex Constabulary, was charged before the Cuckfield magistrates with assaulting Mr. Lombardi, photographer, at Brighton. Complainant, while returning home, was called into a house to assist in attending to a man who had been fatally assaulted in the locality. Defendant was there, and, in the opinion of several witnesses, he was the worse for liquor. Mr. Lombardi asked his number, which he refused, and an altercation followed, during which the alleged assault was committed. Verrall was fined 40s. and costs.—*Echo*.

To Correspondents.

DIAPHRAGM.—The position of the Waterhouse diaphragm between the front and back lenses of a portrait combination is determined by the foci of the said lens. If the front lens, for instance, have a focus of six inches, and the back lens of twelve inches, then the diaphragm would be placed one-third of the entire separation behind the front lens, and two-thirds of the distance in front of the back lens; and so on, whatever the foci of the lenses, in due relation. We do not know the lenses in your half-plate combination, but you must ascertain first, and then place the diaphragm on the principle indicated. To make the matter more plain: suppose the front lens have a focus of 10 inches, the back lens a focus of 15 inches, and the total separation be 5 inches, the diaphragm must be placed 3 inches in front of the back lens, and 2 inches behind the front lens. This position gives the maximum of advantages. To secure extreme flatness of field you may place the stop nearer to the front lens.

H. W.—Your copying camera, with lens in the middle, and grooves for negative and dark slides at the ends, ought to have been provided with a means for uncovering the lens without opening the flap at the top. The simplest means is to place a hinged shutter behind the lens, which opens and shuts by means of a pinion at the side of the camera. The absence of such an arrangement has been doubtless an oversight in making. It will be easily added by a camera maker; or it would not be difficult to improvise if you are skilful in the use of tools.

H. TAYLOR.—An arrangement of curtains such as you mention may be made to give pretty good effects of light and shade. Let the canopy overhead project at least six feet; the curtain on the shadowed side of the face about eight or ten feet; and that on the lighted side about three or four feet. The curtains should have some sliding arrangement which will permit you to adjust them so as to suit different sitters and different conditions of light, &c. We fear from your example and description that the lens is not a very good one; but the want of sharpness may arise from want of experience in focussing; or it may be from the ground glass and sensitive plate not being in exactly the same plane when in the camera. Do you get a sharp image on the ground glass? If you do, and not in the negative, the fault may be remedied. But if you cannot get a sharp image on the ground glass, the fault is in the lens. Either C or D of the names you mention will be most likely to suit you. We shall at all times have pleasure in helping you.

EDLIN CASE.—There is no international copyright law between England and America, and hence an American copyright is not protected in this country, nor an English copyright in America.

W. B.—You had better throw away your hyposulphite which is contaminated with iron. There is risk in using it. 2. On adding bicarbonate of soda to a silver bath to neutralise it, carbonic acid is liberated, and hence, on testing with litmus, an acid reaction is of course found to exist. After the solution has remained some time in an open vessel to allow the carbonic acid to escape, you will find the solution neutral. The simple test of sufficient of the soda salt having been added, is the falling of a slight precipitate, just sufficient even to make the solution turbid. So long as the silver solution remains clear whilst the soda solution is added, free acid, which has been present, is becoming neutralized. The moment a turbidity appears, it shows that all the free acid is neutralized, and that the soda salt is decomposing the nitrate of silver, and throwing down carbonate of silver. No more of the soda solution should be added after that.

AN AMATEUR READER.—In sensitizing common paper with bichromate of potash you form a combination between the chromic salt and the size. This size being to a considerable extent in the body of the paper, the picture must of necessity appear sunken in the paper. The use of a surface of gelatine or albumen with very short floating on the chromate solution affords the best hope of remedy; but we have never seen brilliant or rich prints obtained by the method you are trying.

Y. M. F.—We do not know of any objection to a one-grain solution of india-rubber as a preliminary coating in the wet process, except that it is somewhat more troublesome to deal with than albumen, the solvent being necessarily very volatile, and the solution, of course, quickly becoming thicker.

F. HOPKINS.—There is not any general law so far as we are aware in relation to the show-cases of photographers. A case like yours would be dealt with under the local laws of the place as regarding obstructions or encroachments on public space.

L. HILL.—The address has been mislaid; but we will endeavour to find it and let you know.

RECEIVED.—"Ram Rhymes," by W. A. Chandler, illustrated by Edwin Cocking.

Several Correspondents in our next.

The Photographic News, June 4, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO THE RECENT GUNCOTTON EXPLOSION AT WOOLWICH—THE ACTION OF HYDROGEN UPON NITRATE OF SILVER—THE BREMEN PHOTOGRAPHIC SOCIETY.

The Recent Guncotton Explosion at Woolwich.—The disastrous accident with guncotton at Woolwich, last week, can scarcely be without interest to photographers, for after its employment as a military and blasting agent, there is no greater application of the material than in photography. And although the products used by photographers for the manufacture of their collodion are not precisely the same chemical compound as the very explosive material that engineers and miners deal with, still there is enough resemblance as to cause them to be practically regarded as the same thing. It was only the other day that we recommended our readers to keep any large supplies of guncotton they might have in a moist state, adding twenty or thirty per cent. of water to it, for when in damp condition pyroxilin is a comparatively harmless body. Not only will it refuse to explode under the same conditions as dry guncotton—that is to say, by means of a detonate fuse—but it is altogether unflammable when a flame or red-hot iron is approached to it. According to the experience of chemists well versed in its properties, wet guncotton can only be exploded when a charge of dry material is in contact with it, and this is fired first of all. That no other way exists of detonating or exploding wet guncotton it is, perhaps, too much to say in the face of the explosion that has recently occurred; but, that photographers may not be alarmed in any way, we will detail the precise circumstances under which the charge of wet guncotton recently exploded at Woolwich. Some experiments were being made at Shoeburyness with guncotton, and to carry these on a few shells filled with the explosive were required. When dry guncotton was put into shells and fired some years ago at Shoeburyness, the charge exploded, on the discharge of the gun, while yet the shell was inside the bore of the cannon, and the latter being sadly injured, no further experiments were made. When, however, it was found that wet guncotton could be detonated under the conditions we have mentioned, fresh experiments were decided upon by shells filled with wet guncotton. It is, of course, the object of artillerymen to detonate a shell at the end of its flight into as many fragments as possible, and the violent manner in which guncotton detonates seemed to promise an effective way of doing this. The wet guncotton, it was found, did not explode on the discharge of the gun, so they determined to cram in as much cotton as the shell would hold, in order to shiver it into fragments. Wet guncotton has been considered to be such a harmless material that, instead of being manipulated in a small shed far removed from human habitations, as is the case when gunpowder is handled, it has been worked in a factory where many scores of men and lads were engaged on other operations. Three men, who had been specially instructed to fill the shell, employed a powerful hydraulic ram for pressing the material into the projectile, and in this way it was tightly filled. A space was required at the head of the shell to receive the charge of dry guncotton which was to start the detonation, and, to make room for this, a pointed metal plug was forced into the mass of cotton. At this moment it was that the explosion occurred, and the shell breaking into pieces lacerated two men so severely that they died soon afterwards, while a third was badly injured. The curious part of the business was this: although there was an explosion, only a small portion of charge was burnt, and the shell was broken up into very large fragments. Had there been a detonation, the whole mass of guncotton would have been consumed, and the shock been far more violent. Indeed, not only the factory, but buildings in the vicinity must have been levelled to

the ground under such circumstances, and herein lies the mystery. The solution of the matter would appear to be that heat was evolved by the hydraulic ram forced into the guncotton at a high pressure, so that a portion of the material around became dry, and the friction between the ram and the bottom of the iron shell (supposing the ram to have reached the bottom) set fire, and exploded so much of the cotton as would burn, and in this way the shell was burst in the mild form we have seen. It was, every one must admit, a very severe test for even the safest of explosions to bear, and really one can hardly be astonished that even wet guncotton should not become dangerous under such a trial. One cannot have to do with a dangerous material without running some sort of risk; but photographers, we repeat, need not be apprehensive in any way at the occurrence. There can be no doubt that to keep pyroxilin in a moist state is the best plan of insuring oneself against risk, and as photographers never have occasion to treat the material in any vigorous manner, similar to that we have described, there need be no fear of danger from its storage in this way. Under any circumstances, it is foolish to regard pyroxilin, or other similar compounds, in any other light than as dangerous explosives, and they should therefore always be treated as such. We have no doubt that the authorities of the Royal Arsenal will take measures to prevent the recurrence of such a lamentable affair.

The Action of Hydrogen upon Nitrate of Silver.—It will be remembered that a short time ago we alluded to some experiments undertaken by Dr. Russell, whose results seemed to prove that pure hydrogen had a reducing action upon nitrate of silver solution. This conclusion was wholly at variance with the results of M. Pellet's experiments, who had also investigated the action of hydrogen upon an acid solution of nitrate of silver, and had been unable to find any reduction of the compound at all. The discrepancy between the observations of the two chemists it was sought to explain away by the different duration of the experiments, or by reason of the too great acidity of the solutions employed by the French chemist. It is satisfactory to learn, therefore, that a third chemist (also a Frenchman), M. Beketoff, has investigated the matter, and his results corroborate those of Dr. Russell. M. Beketoff quite agrees with Dr. Russell in affirming that hydrogen, when quite pure, has the effect of reducing nitrate of silver solution after a considerable period; but as it appears probable that the reducing action is stopped when the silver solution has a certain degree of acidity, M. Beketoff proposes to continue the investigation to clear up this point.

The Bremen Photographic Society.—A photographic society has just been established at Bremen which already numbers thirty members. Hamburg, a sister seaport town in the north, has for a long time past had its society; but these two are the only second-rate towns of Germany which have such bodies. Berlin till very lately had two societies, but one of them is, we believe, now extinct; at any rate, its organ, *Licht*, has for some time past failed to appear. Since Dr. Krone, the president of the Dresden Photographic Society and editor of *Helios*, went off to the South Pacific to observe the transit of Venus, we have had no photographic news from the capital of Saxony; so that recently Vienna and Berlin have been the only two cities where photographers have met together. We trust that the formation of the Bremen Society is a good omen, and that other large cities in Germany will also follow suit in the revival or organization of photographic societies.

THE PRACTICAL PRINTER IN AMERICA.

XXVII.

ROLLING THE PRINTS.

THE prints, after they are properly "spotted," are ready to be rolled, which should be done at the time when they

are slightly damp, as a better polish is then given to them. There are a number of presses in use which are generally good. A nickel plating is given to many presses, because it prevents their rusting. There are, of course, a number of different size presses for large and small prints. The common cartes and imperial prints should never be rolled on the large press. The press, before use, should be thoroughly cleansed with a piece of cotton-flannel and a little common alcohol. When not in use, always keep the presses covered. About once a week they should be thoroughly cleansed, and oiled with a drop or two of sweet oil.

When the press is cleaned the prints are, one at a time, to be placed in between the rollers, either face up or face down, according as to which roller is the polisher. They should be placed in with the left hand, while with the right the crank is turned. The pressure at the press should not be so heavy that the operator at it will experience any difficulty whatever in turning the crank with one hand, while the press is fed with the other. Do not stop turning the crank while a print is between the rollers, or it will be creased, and consequently ruined. Roll the print once lengthwise, and then twice sideways, and when the roller has taken hold of the card on the one side, place your hand over to the other side of the press where it comes out; take hold of the card when it appears, and bend it so that the back will bend in slightly, and thus give the picture the look of being pressed forward. Bend in the back of the card but a very little, however.

Mr. Hearn recommends the judicious use of Entrekin's Oscillating Enameller, an instrument which gives a similar result, by somewhat similar means, to that produced by Weston's Burnisher. He says: "It is good for several reasons, among which are the following:—1st. It decidedly improves the tone of the print. 2nd. It makes the general appearance of the print richer. 3rd. It gives transparency and beauty to the whole print, especially in the shadows."

The prints, after they are rolled, are ready to receive the final treatment, which ends the processes through which they have to go before delivery.

WAXING OF THE PRINTS.

For the purpose of finding the best thing for waxing the prints, I have, at the expense of considerable time, experimented, and I have, I think, succeeded in finding what I was after; and although it is not new, yet I can recommend it to be the best, of more than a score of kinds of pastes that I have made, mainly on account of its cheapness and simplicity in the making.

Marseilles soap is most generally used in the making of this paste, and for those who may wish a formula containing it, the one below will be found to be excellent.

Virgin white wax ...	...	2 ounces
White Marseilles soap ...	...	1½ "
Boiling water ...	...	2 "

Cut both the wax and soap into very thin slivers, and place in a clean china mug containing the boiling water, and place the mug with its contents into a tin pan, also containing boiling water, the whole of which is placed on a hot stove. Add the wax and soap, a portion at a time, until all are dissolved.

I recommend the dissolving of the soap and wax in small quantities, as it will be more thoroughly done. In obtaining Marseilles soap, always procure the white, and never the spotted. While the wax and soap are dissolving, stir thoroughly with a clean glass rod. This paste, when made, will have the consistency of "cosmoline." When cooled, it is ready for use, and should be applied as will be given below. A few drops either of the essence of lavender, cloves, citronella, rosemary, bergamot, &c., may be added to give an agreeable odour to the paste.

There are other formulae containing benzole, oil of spike, gum elemi, &c., in various proportions, which ingredients being a little difficult to obtain and to prepare, it is a

matter of considerable trouble to the beginner, consequently I will not place them here.

Out of all of the different kinds of paste I have made I have settled down to that of plain wax and spirits of turpentine. It is made as follows: white wax is placed, in a common clean china mug; which mug is placed, as above described, in a pan containing water, which is kept at a boiling state by being placed over the gas stove. Dissolve about two or three ounces of the wax in the mug, and then gradually add about three-quarters as much spirits of turpentine as there is dissolved wax, stirring well all of the time, and finally add of some essence—as the essence of bergamot—in quantity sufficient to destroy the smell of the spirits (said quantity being about half an ounce). Stir the whole thing well.



So that a quantity of photographs can be waxed in a comparatively short time, I made a couple of wooden frames (see fig.), one for the small carte, and another for the imperial. They are very simple in construction, being merely a suitable-size piece of planed pine wood (upon which the back of the card rests while waxing), with narrow strips of wood nailed on the top, bottom, and one side of them. The prints are placed in these frames for the purpose of keeping them from slipping about. Instead of having the strips A A A fastened to the main board, as it is in the fig. they (the strips) can be movable, and fastened to the print when necessary by means of a thumb-screw.

By the aid of these frames I have thoroughly waxed one hundred carte-de-visite photographs in an hour and a quarter.

This paste should be applied to the prints by placing a small quantity on the hardest (i.e., the unnaped) side of some Canton flannel and rubbing it well every part of the print, and then, with another and a cleaner piece of flannel, the surface of the print is rubbed briskly until quite dry, and then the final polish is given by using the soft (naped) side of the same piece.

I have recommended to use the harder side of the flannel first, because if the other is used before the greater part of the wax is rubbed dry it will remove the stringy cotton stuff, and thus it would be rubbed in the wax on the surface of the print, which will, especially when looked at obliquely, show very badly. Rubbing quickly will give a most marvellous polish to the prints, especially if it has previously been rolled, and assists wonderfully in bringing out detail in the deep shadows, and also gives a fine effect to the whole print.

Soiled photographs are rendered so clean by the use of this paste that they will look like fresh ones.

The prints, when waxed, should be allowed to remain all night, or at least for a few hours, in a cool and thoroughly clean room.

PRACTICAL PORTRAIT PHOTOGRAPHY.

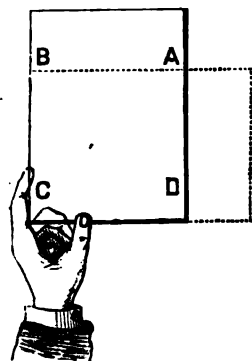
BY WILLIAM HEIGHWAY.

CHAPTER VI.

THE MANIPULATIONS IN THE DARK ROOM.

Coating the Plate with Collodion.—So many descriptions have been written of this operation, most of which seem to paraphrase Hamlet's instruction of Rosencrantz and Guildenstern in the art of playing on the pipe, that I am almost tempted to tell the reader to see it done by some experienced operator, for that is almost necessary. Practice alone will enable you to coat a plate with a perfectly clean and even film. The plate is held, resting on the edge of the first finger, and middle joint of the second finger underneath the plate, and the tip of the thumb over, as seen in the diagram. It would be well to practice holding the plate in this position firmly yet gently, before prac-

tising with the collodion bottle, until the hand gets steady. Do not get into a bad habit of holding the plate by bringing the whole of the fingers to aid you, or by spreading



the fore-finger into the centre of the under side of the plate, and the thumb over the corner, the result being that the warmth communicated by the tips of the fingers to the plate causes the collodion to "set" on those points too rapidly, and thereby spoiling the negative, and the thumb has done its share of mischief by coming in contact with the collodion, causing stains and breakage of the film.

Hold the surface perfectly horizontal when pouring on the collodion at point A, and continue till the collodion has reached the outer edge of the plate, then direct it by gently tilting to B, then by lowering the level of the corner at C it will flow there, and letting it escape the tip of the thumb flow it to D corner, under which you should have the collodion bottle ready to catch the surplus. Without very much alteration of the horizontal position of the plate, it should be very gently rocked until its film is set; i.e., when on touching its surface with the finger it receives an impression of it as in soft wax, without tearing away. It is now ready to be immersed in the bath. It is very necessary to success that while enough collodion is poured on the plate, it shall not receive too much. Experience alone can enable you to determine this.

The Immersion of the Collodionised Plate into the Silver Bath.

—This operation is also a peculiar one, requiring care and steadiness. The plate is placed on the dip rod in the direction held in the previous manipulation, the edge B A resting on the prongs of the dipper. It will be noticed in the "set" film that one edge—that which the collodion first covered (which we will call the upper edge)—is thinner than that which it last reached, and was lowest when the surplus was drained off. Of consequence, the upper edge sets a little quicker than the lower, and is one of the reasons why it is immersed first. The plate, properly resting on the dipper, is gently lowered, steadily and without hesitation, into the silver solution, and immediately it is submerged it is subjected to a gentle motion by a circular movement of the hand. When first immersed the alcohol and ether in the collodion film repels the water of the bath, and if the plate were now viewed it would be seen to have what is technically known as a "greasy" appearance, similar to a greasy plate on which water has been poured. The silver solution first clings to the plate in drops and patches, then in little rivers and streaks, and finally the whole of the collodion film becomes smooth and creamy; after this point is reached allow the plate to remain in the bath a minute.

If the plate has been immersed too soon after coating with collodion, before it is properly set, the water in the bath precipitates the cotton of the collodion, and gives rise to a spotty appearance on the plate. If, on the contrary, the plate has been held too long before putting it into the bath, the uneven evaporation of the collodion causes bluish patches in the film, which are insensitive to the action of light. Too rapid an immersion causes streaks, and a plate arrested in its descent will be marked with a horizon-

tal line indicating the surface of the bath solution at the moment of stoppage; these are known as "hesitation lines." When the plate is removed too soon, although it may have a smooth surface, the solution runs down in little rivulets, causing streaks by inequality of sensitiveness, which streaks become painfully manifest on development of the plate. Being perfectly satisfied that the plate is sufficiently sensitized, it is held up on the edge of the bath to drain for a few moments, and then placed in the carrier or holder. This should be done as the plate was before placed on the dipper, the thin edge downwards, because the flow of the silver in draining the plate has been that way, and to reverse it would cause a reflow of the silver over the surface of the plate, thereby causing streaks, and because after exposure, the plate is taken out and held by the now upper and thick edge, that being the best to develop from, for reasons which will be explained when we come to consider the development of the plate. The film at the time of placing the plate in the holder should be perfectly smooth and of creamy semi-transparency, not at all bluish in colour. After exposure in the camera, to which it is taken when the shutter of the holder is closed, it will be found to have gained in density, i.e., become more opaque, retaining its creamy colour, showing conclusively that decomposition has been going on after its withdrawal from the bath. The plate should not be prepared any considerable time before it is required for exposure, otherwise insensitive patches mark the places where the film has dried, and metallic silver stains where the solution on the surface has been drawn from the lower edge (as in the carrier by capillary attraction). Improperly carrying the carrier or holder in a horizontal position causes the same markings, by allowing the silver solution to run over the plate.

Nothing definite can be said relative to the length of

EXPOSURE,

as that is entirely dependant on the amount of light and the nature of the subject, the state of the atmosphere and the time of day, &c. This subject will be treated more fully when we are under the skylight, and we may presume that having done our part in the dark room, the plate has been handed to the skylight operator, and that it is properly timed in the exposure.

We now approach the most delicate and beautiful of the manipulations of the dark room—*developing*. Before we say anything on this subject one or two words of warning are necessary as to the treatment of the carrier. It must be held or stood in perpendicular or upright position from the time of the plate being placed in until it is taken out. It should not be kept a long time waiting for the arrangement of the sitter, as that should be done before the plate is withdrawn from the bath. Two pictures should not be made on one plate, unless they are two of the same sitter in the same position with the same light and exposure, or unequal results will be the consequence, as will be seen when we understand the development. It is impossible to get identically the same conditions in a plate at different times, because the character of the plate is undergoing a continuous change; nor can you get the same conditions of light and exposure. *Keep the carrier clean.* After each plate, wipe it out with a tuft of cotton or piece of rag, and keep the slide free from dust, as, on its withdrawal to make the exposure, the dust is set in motion to the detriment of the plate. Preserve the carrier from splashes of any of the solutions. Silver is a great enemy to the existence of the carrier, and to guard in some measure against its action on the wood and corners it should be frequently rubbed over on the inside with tallow; this, too, attracts and holds any stray particles of dust (which are sure otherwise to be set in motion on the withdrawal of the slide), as well as protecting your holder from the action of the silver from the plate. Place one or two thicknesses of blotting-paper on the back of the plate in the carrier, as this prevents a great deal of silver from running down.

NORTH LIGHT FOR STUDIOS.

Mr. S. V. ALLEN, in our Chicago contemporary, the *Western Photographic News*, in the course of a series of articles on "Popular Photographic Blunders," attacks the common prejudice in favour of a north light. He says:—

"The veteran rejects with scorn the offer of any other than 'a pure northern light.' Perhaps it would be more exact to say he repels the suggestion with contemptuous indifference. The merest tyro, as well as the practised operator, is equally settled in his convictions on this point. With nineteen out of every twenty photographers, the vast superiority of a northern light over any and every other light is a point that is absolutely settled—settled even beyond the remotest possible necessity of discussion. The suggestion that all this may possibly be wrong, and that further consideration might well be given the subject, is a photographic heresy so rank, and indicates so plainly the mere dreamer, that it does not even provoke irritation. It does provoke pity, and it may beget contempt for your chimerical notions. So much I know by experience and by observation. The books advocate north lights, as though no other lights could by any possibility compete with them. In fact, the books ignore everything except a north light; or if, by chance, an east or west light is mentioned at all, it is with expressions of sympathy or commiseration for the unhappy proprietor. But if a west or an east light begets only compassion for the stolidity of its builder, what shall be thought of the one who deliberately and of choice expends money on a south light? The silence of our favorite writers on this subject is significant—he is evidently beneath compassion. The enormity of his blunder protects him even from ridicule.

"Now, if we could always secure a 'pure north light' in constructing our ateliers, this subject might not be a very important one; but, as we all know, it is often much more convenient to obtain a south sky and side light. Hence the vast importance of knowing the relative values of different lights.

"First let me say that I regard this exaggerated prejudice against 'southern lights' as a most surprising photographic blunder. I am often astonished at the great number of false theories it involves, as well as at the remarkable tenacity of opinion our brethren exhibit in retaining these theories, even against the overwhelming evidence of every-day observation. Space will not permit me to criticise all these false theories, nor even many of them. But there are a few of which I must speak in this article.

"Especially dear to the heart of the photographer, and believed in with all the idolatrous tenacity of unreasoning superstition, is the theory that a north side and skylight is superlatively stable, unchanging, reliable, and not given to perplexing changes as all other lights are. Our books are full of this notion; our ideas are saturated with it. It is a theory so well fixed in our minds that we never reason on it. But in reality no notion could be more erroneous, no theory more false. In the whole circuit of the heavens no direction can be selected for the skylight that is more subject to perplexing changes and to absolute variations of the light. In this matter I am trying to be practical. I am referring to ateliers as they exist—to the ninety and nine out of every hundred, and not to the mythical atelier with a 'pure, steady, unchanging, unobstructed northern light,' which, strangely enough, we all think so common, but which in reality has never had an existence, except in the unruffled placidity of our imaginations, and which, further, I firmly believe to be practically an impossibility.

"I would particularly wish it understood that when, in this connection, I speak of a 'steady, unchanging' light, I do not refer to the changes in the amount of light, for a skylight in any direction whatever will be subject to such changes. I refer only to what is of vastly greater importance—i.e., to the changes in the direction of the light.

"To give greater perspicuity to this division of the subject, I will use the term north top window, instead of north light, and for further convenience, let us suppose all north top windows divided into two classes, the first class being entirely protected by some means (such as high buildings, shutters, screens, walls, &c.) from the rays of the sun throughout the year, the second class not being so protected. The first class, of which there is, perhaps, one gallery in a hundred, is easily disposed of, for there is, even with the best arrangement, a certain loss of at least one-fourth of all the light that should fall upon the top window. This may be thought a wild statement; careful observation will prove that it is a true one.

"But how is it with the second class? As a rule the sun's rays, especially in summer, strike first in the morning upon the north-east corner of the top window, gradually changing towards noon to the north half (or to the whole, according to the pitch and other obstructions), thence in the afternoon gradually changing to the north-west corner, and finally in summer shining more or less fully and squarely upon the whole top window. Thus it will be seen that with most galleries the light, even on a clear day, is not the same for five minutes at a time. It is quite impossible to arrange the screens, curtains, and reflectors, and without changing them, make two negatives that are identical in their lighting. (It will be seen from this, by the way, how thoroughly absurd is that other popular photographic blunder, of supposing that the art of lighting can ever be taught through books, by showing which curtains should be opened and which closed, for absolutely different results would be obtained at nearly every sitting.) To illustrate this, let us suppose a sitter placed at any point under a top window, say under the centre. In the morning the light comes uniformly dull from the whole top, a little later a strongly concentrated light comes from the north-east corner, later still a broadside from the whole north half, then from the north-west, and finally, later in the day, a flood of bright light from the whole top. Of course, as I have said, this will not be the exact order of variation for every north top window, but it fairly represents the variableness of all of what I have denominated class two, which means nine-tenths of all the ateliers in the country.

"Not only is the direction of the light constantly changing from morning to evening, but even its changes are not the same from day to day. As the path of the sun varies with the time of the year, from a nearly horizontal direction in winter to a nearly vertical direction in mid-summer, so do the changes of the light vary—a fact which alone is a very serious inconvenience, for on only two days in the year does the sun follow the same path.

"Now add to all these sources of uncertainty the fact that on all days on which there are floating clouds in the sky the direction of the principal light is subject to constant, absolute, and momentary changes (from bright clouds reflecting the sun's rays at every possible and unexpected angle), and you have my principal reasons for exposing myself to the censure of my photographic brethren by condemning the north top light as the most perplexing and changeable of all lights. Except for the truths contained in these assertions, it would be quite impossible to account for the whimsical and absurd effects of lighting so frequently produced in first-class galleries by competent artists; and it also accounts for the exquisitely beautiful effect of light which we occasionally see produced in miserable glass sheds by men who do not understand even the first principles of correct lighting. They are produced by chance. The skilful operator poses his subject, places his camera, draws his curtains, adjusts his eye-rest, sets his reflectors, animates his model: the effect is just to his liking. One minute passes, and he is ready to expose. But now the lighting does not suit him quite so well as before. Why? The sun has changed its position very slightly; the light is changed—only slightly, but the effect is more tame; at least a portion of the

delicate brilliancy is gone. But time presses, and the exposure is to be made; in fact, it must be made, and it must be made that very instant, otherwise the sitter becomes nervous, and the expression listless. There is not one second of time to fool away after the focus is drawn and the model is ready. The skilful operator knows all this intuitively, so the exposure is made and the plate is developed. As a result, he has precisely what he aimed to produce, only in a modified degree. He has, perhaps, a good negative, but it lacks a delicate brilliancy he hoped to secure, and would have secured if the lighting had not changed. Another sitting is made; the same careful adjustment of accessories; the same beautiful image is seen on the ground glass; the plate is ready; five seconds gone; your lens is uncovered. A bright or heavy cloud, as the case may be, has altered its position, and the lighting upon the face is absolutely changed. This is an annoyance of everyday occurrence. Most operators do not sufficiently realize the cause; many never even suspect the cause. They are disappointed in their negatives, and feel disheartened at their repeated failures, but they ascribe them to chance, to peculiarities of complexion, or to chemical vagaries. There are other operators who tell us they never have any difficulty in lighting their subjects. They always secure just the result they aim to produce, and never experience any sensation of misery, or of that "hope deferred which maketh the heart sick," when they develop their negatives. With such artists, really intelligent operators have little sympathy. It is worthy of note, however, that these self-satisfied gentlemen always smoke their pipes of contentment where specimens of their ignorance of the laws of lighting are to be found in abundance. They cannot comprehend that delicacy and precision in lighting are truth and harmony in representation. Like Pilate, they may ask feebly, 'What is truth?' but, like him also, they are indifferent about the answer.

"This, however, is a digression. I have endeavoured to point out, as briefly as possible, an imperfection in our means of lighting that is a constant source of annoyance and embarrassment, and a frequent source of failure to every operator who aims to produce fine pictures. I think every competent operator will, on careful thought, agree with me that fully one-fourth of the failures in lighting may be ascribed to the causes I have mentioned. The important question, however, is this: Is there any means of getting rid of the difficulty? Is there any possible way of securing in reality what we all so sincerely believe we already possess?—i.e., an unobstructed light that is constant in its direction, and not subject to the trying changes that have been described? Theoretically it is quite impossible; but for all practical purposes there is a solution to the difficulty."

FORMIATE OF IRON AS A DEVELOPING AGENT.

BY S. BOTTOME.*

When I first took up the study of photography, in 1854, my kind friend, Mr. H. Deane, called my attention to the peculiar effect of formic acid in changing the tone of the metallic deposit, when employed in conjunction with sulphate of iron in the developer. In those days negatives were developed either entirely with a weak iron developer, or with pyrogallie acid alone; the successive application of the two being undreamed of. I was considered a very successful positive operator, and naturally turned all my attention to that particular branch of the collodion process. The great aim of those who produced glass positives was to procure as white a deposit as possible, so as to insure plenty of contrast. A recipe in which formic acid formed an essential feature, and which gave rather peculiar results, was as follows—Sulphate of iron, 60 grs.; water, 4 oz.; alcohol, 1 drachm; acetic acid, 1 drachm; formic acid, 30

minims. This developer, used in conjunction with Thomas's collodion, gave pictures of a very peculiar metallic bluish grey, and was consequently of little or no use for my special purposes. But I noticed that the image was of a peculiarly dense nature, much more so than when 2 drachms of acetic acid were employed instead of the mixed acetic and formic acids. I was at first led to suppose that the acetic acid, being in larger quantity, acted as a restrainer, and consequently gave a less dense image than when formic acid partially replaced it; but a trial made with 1 drachm of acetic acid without the formic acid showed that the latter had much to do with the density of the deposit. My attention was then withdrawn from this point, and I gave no further thought to the subject until within the last month, when, having read an account of a series of experiments lately instituted in Germany, with regard to the efficacy of return developers, it occurred to me to try the effects of *formiate of iron*. To this end, 63 grs. of dried sodium formiate were dissolved in 5oz. of water, to which were added 5oz. of water in which 278 grs. of crystallized sulphate of iron had previously been dissolved; 100 grs. of pure sugar were then dissolved in 10oz. of water, to which were added 30 minims of acetic acid. The two solutions were then mixed together.

With a developer thus prepared I have produced negatives of an extraordinarily dense character, with an exposure but little more than necessary to produce a positive. No subsequent intensification was necessary. It may be as well to mention that the collodion was one prepared by Stanley, of London Bridge, and was not, therefore, specially prepared for the purpose of trial.

ACTION OF DIFFERENTLY REFRACTIBLE RAYS ON IODIDE AND BROMIDE OF SILVER.

BY E. BECQUEREL.*

When a sensitive photographic plate, prepared in the ordinary manner with silver iodide and collodion, is exposed for a short time to the solar spectrum, the image, when developed with pyrogallie acid, is found to extend only from the violet to between F and G. But if a little chlorophyll is added to the collodion employed, the plate, under the same conditions, shows also a feeble but well-defined action, extending from E to beyond B in the red, with a remarkable and strongly marked band of maximum effect between C and B. The photographic action in this band, however, is much weaker than that which takes place in the violet, and attains the intensity of the latter only when the red end is exposed from five to ten times as long as the violet. Other much less strongly marked bands may be perceived between E and B. The author finds that the conspicuous band between C and D coincides in position with the characteristic absorption-band of chlorophyll, as he observed it in the collodion solutions made use of in preparing the plates. The colouring matter on the photographic plates obviously does not act as a screen, cutting off the absorbed rays, for in that case the contrary effect would be produced; but we may explain the phenomenon by supposing that the silver salt is so connected with the chlorophyll that an action set up in the latter by the rays it absorbs communicates an impulse to the former by virtue of the intimate association of their particles.

The author long ago showed that when sensitive plates are exposed for an instant to sunlight before submitting them to the spectrum, the range of the chemical action is greatly extended towards the less refrangible end. These earlier observations are readily explained by the results above described. We may suppose the exposure to operate by producing a change of colour, or other physical condition of the upper film of the plate, by which its absorptive power for the different rays is altered.

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"NONPAREIL" OR "ALBA" PLATES FOR PHOTOGRAPHS.

WE called the attention of our readers to an American novelty in the shape of a white enamelled iron plate as a substitute for opal glass in photography, announced as "Nonpareil" plates and "Alba" plates, both being, we believe, precisely the same thing, the different names indicating different agencies rather than different manufacture. We are now indebted to the courtesy of Messrs. Anthony and Co. for an example of the Nonpareil picture, and to the courtesy of Mr. Atkinson, of Manchester, for examples of the plates, and of the collodio-chloride of silver prepared by Messrs. Anthony and Co. for working with these plates. A few words of description of the materials and results will probably interest our readers.

The Nonpareil plates seem to be in every way a singularly excellent basis for a photographic portrait. Thin, light, and sufficiently rigid, like the ordinary ferrotype plate, the Nonpareil, instead of black or chocolate, like the ferrotype, present a fine delicate matt surface of pure white, surpassing almost any similar surface we know, but most like the surface of pure white marble, smoothed, but not polished. Whilst perfectly rigid and free from liability to warp, cockle, or readily bend, break, or injure in any way, it is as light as a piece of card, and may be cut with scissors in a similar manner; hence for lockets and similar matters it affords singular convenience. The Nonpareil picture sent to us from New York is printed by the collodio-chloride process, and is in every way charming.

We at once put the collodio-chloride sent by Mr. Atkinson and the plates to the test of practice. The plates do not require preliminary coating or preparation of any kind, but are sold ready for use. The collodio-chloride prepared by Messrs. Anthony and Co. is sent out in two bottles, one containing collodion with nitrate of silver in solution, and the other collodion with the chloride in solution. The two require mixing in equal parts in accordance with accompanying instructions, and the mixture, after standing for a short time (say a quarter of an hour), is ready for use. The plate is coated in the ordinary way, and allowed to dry in the dark. It is scarcely necessary to remark that care should be used to see that the thick film of collodion at the edge where it is poured off should be quite dry, so as to avoid injury to the negative in contact printing. In the instructions forwarded with the collodio-chloride, fuming the film is recommended, and we have no doubt, from experience, that greater sensitiveness and greater richness would be the result; but we proceeded to print without the fuming, and obtained perfectly satisfactory results. The exposure in printing was much shorter than would have

been necessary with ordinary albumenized paper, and the colour a rich warm purple, bronzing readily in the deep shadows. We tried toning with a bath of sulphocyanide of gold, similar to that we have described as working well with collodio-chloride prints on paper, which answered admirably. We also tried an improvised bath, made by adding a little chalk to a concentrated solution of chloride of gold, then pouring on hot water, and using when cold. In this case we made the bath very weak, about fifteen ounces of water being used to one grain of chloride of gold. This toning bath also answered perfectly. In fact, any of the usual toning baths, employed somewhat weak, will, we doubt not, give good results. The fixing and washing are very rapidly effected, involving neither the time, labour, nor uncertainty involved in washing prints in the ordinary silver printing process.

The operations in producing the Nonpareil photograph are as simple as the results are pleasing. In working with collodio-chloride on opal glass, considerable care is at all times necessary to avoid injury to the surface of print or negative from the pressure of two unyielding surfaces, and equal care to avoid the breakage of either. Care is also necessary in working with a suitable frame to secure exact register in examining the progress of the work. With these plates such care and anxiety become unnecessary. Whilst the plates possess sufficient rigidity for every purpose required, being very thin, they are not absolutely unyielding, and therefore there is no risk of breakage or abrasion of the surface. Being elastic, the progress of printing may be examined as in paper prints, rendering no special pressure frame necessary. In short, this plate seems to supply both in beauty and convenience the very tablet for which we often wished in prosecuting our experiments in working out the collodio-chloride process before presenting it to the public. It is easy and simple to use, and the results are charming, and we think there can be but little doubt of their permanency.

We should add that whilst the Nonpareil plates are especially designed for collodio-chloride printing, they appear to be available for various other purposes. They may be used for developed collodion prints produced in the camera by the wet process, for transferred collodion films, and as a basis for carbon prints, and, in fact, any purpose where a very pure white surface is required on a support almost indestructible.

WOODWARD'S MICRO-PHOTOGRAPHS.

THE Photographic Society of Vienna has been favoured with a collection of pictures from Lieutenant-Colonel Woodward, of Washington, produced by means of a microscopic lens. Colonel Woodward, it appears, has experimented with all sorts of lights in the production of photographs of microscopic objects, and has used for the purpose sunlight, electric light, lime light, and magnesium light. He does not work with the aid of a camera, but in a darkened room, so that between the lens and the dark slide there is a free space, and the focussing in this way is more easily effected.

Colonel Woodward prefers sunlight to any other, now that he has been able by means of a particular kind of illuminating apparatus or condenser to modify the sunlight, so that it gives results similar to the lime and electric light, which in the first instance gave the best results. Colonel Woodward was especially desirous of using sunlight for his purpose, as in cloudless Washington, where clear skies are frequent, it is the cheapest mode of illumination; but he has made much use of magnesium light also, and has devised a peculiar arrangement for subduing the disagreeable magnesium vapours. He provides the short chimney of the box, in which the magnesium is burnt, with a spiral of wire, and round this is placed some coarse net, the end of the spiral or tube ter-

minating in a wide bag. The air goes through the netting whilst the cooled oxide of magnesium is collected in the interior of the pipe or in the bag.

Woodward employs various lenses for the production of his photographs; in the case of very large amplifications, immersion lenses are employed. His enlargements embrace the whole scale up to 2,400 diameters. He is connected with the Sanitary Division of the United States Army, and his main efforts in micro-photography are directed to the production of physiological preparations. The establishment to which he is attached possesses already thousands of negatives, and Colonel Woodward has forwarded to the Vienna Society a series of "test objects," which are, of course, exceedingly interesting. The *Robert Scala* and *Pleurosigma angulatum* and *formosum* he has produced in different degrees of enlargement, illuminated by direct and also diagonal lighting. The pictures are exceedingly fine, and give a wonderful idea of the construction of the diatomacea. Of course, in the case of very extensive enlargements, the pictures are not very sharp, but the lines and drawing are remarkably clear, and not only are seen, for instance, the threefold marks, but their linear detail is shown, and they are not merely rendered by three distinct lines; even the six-angled cells are visible in the pictures.

The Woodward photographs, being for the most part of a physiological nature, will be exceedingly useful for medical schools and museums. The employment of microscopes, although no doubt indispensable in science classes, might be obviated to some extent by micro-photographic illustrations, and these thrown upon a screen in class-rooms and lecture theatres, by means of artificial light, would be a material aid to professors. We know that many of the medical staff of our hospitals in London would consider themselves very fortunate to secure such photographs as Colonel Woodward has produced, and their publication together with a catalogue would be a boon to many scientific medical men.

FRENCH CORRESPONDENCE.

METHOD OF OPERATING BY REFLECTION—HOW TO PRODUCE ORNAMENTAL BORDERS TO PORTRAITS—BLUE GLASS LENSES—DRY PLATES—A REGISTERING PHOTOMETER—M. LAMBERT IN ENGLAND—SPIRIT PHOTOGRAPHERS AND THE POLICE: A CUPBOARD FULL OF SPIRITS DISCOVERED.

SOME days ago I received from a photographer who is already well known as having prepared a new kind of pyroxiline (M. Tassan, of Montauban) a letter describing a series of ingenious processes.

The first permitted him to utilise any space or apartment situated on the ground floor, and therefore but inadequately lighted, for carrying on photographic operations, being able to produce portraits as easily as in any glazed studio. M. Tassan places the model about a metre from the illuminating opening or window; behind the model he places a portable background about a metre broad, and in front he fixes a mirror. It is the image reflected by the mirror that he photographs, and not the sitter. He asserts that by this means he can obtain all the effects of the light, including the lighting up of the face.

In the manner following he transforms old clichés, varnished or unvarnished, into pellucid images. He pours upon the negatives, placed horizontally, a film of special collodion, which he allows to dry. The cliché is in this way covered, as it were, with varnish, and is in a position to resist the printing of any number of copies. When it is desired to detach the film of collodion and negative image from the glass plates, the whole is plunged into a bath of water, and after three or four hours' immersion the whole image comes away with the greatest ease, and as it preserves its suppleness and flatness, it can be easily kept in good condition. I have had now in my possession, for some weeks, several clichés of this kind, and they are as perfect and as

flat as on the first day. The author of this publication has also sent me some pictures of medallion format, with an ornamental border or framework which is obtained at one single printing by the aid of two clichés superposed. The first is an oval portrait in the middle of a plate which has been kept transparent at the margin during its sojourn in the camera by placing in front thereof an oval mask. The second cliché is executed from a bas-relief, the central portion (corresponding to the oval portrait) of the sensitive plate being protected by a mask from the action of light. The photographic apparatus is placed at a convenient distance, to reduce the image of the bas-relief to the proper dimensions of the plate. When the second negative has been obtained with a clear oval in the centre, the film is stripped in the way indicated, and superposed on the first negative, so that the two may then be printed together. The same ornamental margin negative will of course serve for any number of portrait negatives.

The different processes of M. Tassan are ingenious, and the results which they furnish plead in their favour.

I spoke in a recent letter of the lenses of coloured glass which M. Berthiot has introduced into the middle of his instruments for increasing their rapidity, or, at least, to render the pictures they furnish more harmonious. M. Boivin has communicated to me a more simple means still, and quite as efficient, which he employs for the same purpose. It consists in placing about two millimetres in front of the sensitive plate (in the dark-slide) a plate of glass more or less tinted with blue, according to the effect it is desired to produce.

The dry collodion process is, in conjunction with carbon printing, the subject which just now occupies photographers most. The experiments made in this direction tend above all to augment the rapidity of the process, and I am very much mistaken if M. Franck de Villecholle has not solved the problem. I assisted, the other day, in his studio, at an experiment which appeared to me of a most conclusive character. A plate prepared by him nearly a month previously was placed in a stereoscopic camera, and a view of the surrounding houses was obtained. One of the lenses was uncovered for ten seconds, giving one half of the plate this period of exposure; the other half had but six seconds' exposure, through the second lens, and then the two pictures were developed at one and the same time, being, of course, upon the same plate. It was found then that the pose of six seconds was ample. The development, which was very rapid, was conducted in the most simple manner. In the first place, alcohol and water, in equal parts, was poured upon the impressed film, and then a mixture in equal parts of an alkaline solution and of pyrogallie acid. M. Franck has not yet given us the formula, nor the composition of his collodion; he has only affirmed that the whole of the improvement in the process consists in certain modifications of the old tannin process. Under the action of the alkaline developer the image appears immediately in all its details; without trying to develop it too much, it is intensified with silver, and in a few seconds assumes the requisite amount of vigour. M. Franck has assured us that with a portrait lens, and operating in a glazed studio, it would be easy to secure an instantaneous portrait; and this is easy of belief after having seen the results.

M. Liebert is constructing just now a registering photometer after an idea of M. Lambert. This very ingenious apparatus—which we will describe more fully as soon as the necessary drawings can be secured—possesses the advantage of advising the operator when the pose is sufficient. The photometer may be regulated according to the weather, just in the same way as a clock alarm may be set according to the hour you desire to be awakened. The same idea has been already worked upon by M. Boivin, who showed some time ago a bell photometer; but M. Lambert, it appears, has been the first to patent the invention.

Since I have mentioned M. Lambert's name, I may say how pleased I am to hear of his departure for England. I

am sure that he will be graciously received in a country of progress like yours, for he is a man of intelligent activity, who has succeeded, despite the trammels of routine, to bring out upon a practical footing a process of enlarging and printing in carbon, which has for a long time past been considered by many to be attended by insurmountable obstacles. I am quite certain that when English photographers have seen his invention, Lambert-type, at work, they will at once understand the success that has attended his efforts in France, and they will find that nothing exaggerated has been said about the fine pictures produced in this style.

Last year I entertained the readers of the PHOTOGRAPHIC NEWS with an account of the stir that was being made in Paris by fantastic portraits executed by a so-called spirit photographer. Notwithstanding some severe strictures in the public press upon this enterprise, it seems that a very large trade has been doing in these wares for a long time past. So gigantic has the affair become of late, that the police have stepped in and put a stop to speculations which rested upon the credulity of purchasers. As I announced some weeks ago, the Prefecture of the Police has now a studio of its own, and thus it is enabled to appreciate and understand very readily any photographic matters that come under its attention. A Commissary of Police, accompanied by one of the photographic staff, presented themselves, therefore, one morning at the studio of the spirit photographer, and these customers desired that their portraits might be taken accompanied by a spectre. The artist posed one of them, focussed, and then, under the pretence of invoking a spirit, he asked his visitors to withdraw and to step for a while into the waiting room. After an absence of ten minutes the photographer called them back again, and begged the model to take his place once more. Instead of doing so, however, the Commissary of Police produced his badge of office, and introducing himself and his friend under their real titles, called upon the medium to acknowledge his trickery. It was no good refusing under these circumstances, and the operator, withdrawing his dark slide again from the camera, attended the two police officers into the dark room, where he developed before their eyes a very weak image, which had been impressed upon the plate during their absence, of a little figure made up like a ghost. If the operator had not been arrested in time, a portrait would have been produced beside the ghostly figure, and a spirit photograph would have been the result. In an adjoining room were found quite a collection of draped dolls more or less like great men that have departed this life, which were used as occasion served. Quite a store cupboard full of spirits was discovered.

At this moment, the ingenious but misguided photographer in question is under orders to present himself before the Paris tribunal to answer to a charge of swindling the public.

ERNEST LACAN.

A GRATIFYING ACKNOWLEDGMENT.

BY W. T. BOVEY.

THE many, among photographers, whose minds have long been painfully exercised because of the humiliating status accorded them by a non-discerning public, cannot but feel highly gratified by a recent and graceful compliment paid to their art and labours by an erudite, and in all other respects an expert and accomplished writer, who, in a critique published in the columns of the *Daily Telegraph*, accredits photography as the immediate resuscitator of a dying art, which in its zenith had transcribed human forms and features with exactness and grace.

"Prior to the advent of photography" (so writes our conscientious, albeit heterodoxical critic) "British portraiture was more than dead. It was an unburied corpse, ghastly and repulsive. Portraiture in England had become a lost art, and in the art of producing representations of the human form divine we might have taken lessons

from the war canoe daubers of New Zealand, or the pot-painters of the Celestial Empire. Two causes brought about the revival of the art. [Note.—*Photography was the first.*] The earliest Daguerreotypes of Claudet and Beard—flat, cloudy, ugly, and evanescent as they were—still from an artistic point of view were as superior to the best average pictures exhibited at the Royal Academy as a portrait by Titians or Vandyke was superior to one by Miss Lacreevy or Dick Pinto. But when the Daguerreotype gave way to the Talbotype, when the magical wands of collodion and albumen were waved over plates and paper, and when the wonderful invention of photographic printing was developed, the doom of the conventional portrait was sealed, and the revolting thing became not only a monstrosity, but virtually an impossibility. In the face of the blessed sun, drawing so beautifully, distributing light and shade with such marvellous grace, rendering expression, atmosphere, substance, transparency, texture, with such astonishing fidelity, conventional portraiture could not but feel ashamed—could not but feel that henceforth it was no longer permissible to tell such lies as had hitherto passed current."

Well done, honest critic! A veritable Daniel art thou in wisdom and in judgment; and with the courage of a Wilberforce thou hast braved prejudice and depreciatory opinions. Perchance by-and-by you may venture further, and tell the world that all portrait photographs are not "ordnance maps," or "microscopically objective charts." I grant you, photography does not create expression; but faithfully it transcribes if aught of expression exists in the countenances of the original. If the works of A. Salomon, V. Blanchard, Robinson, the smaller productions of Mr. Crawshaw, together with portraits produced by many other talented photographers, be compared with examples of hand painting, it must be acknowledged that no painter, no engraver, ever succeeded in depicting more life-like and faithfully those mental characteristics which can be read by a glance at the faces of many of our eminent men. When features bear no impress of the mental light which hidden shines within, as in the case of Oliver Goldsmith, a portrait of such individual as painted by a Vandyke or Reynolds is much to be preferred to any camera production, because the producer, by his skill, whilst preserving the likeness, impresses on it a reflex of the qualities of mind; and thus is seen the man as nature moulds him throughout, save that flesh becomes transparent and mind is seen in every feature. Rarely, however, has the painter's cunning hand to work on hidden intellectual powers. More frequently has he to gratify, with an addition of naturally false gifts, courtly dames, socially elevated misses, dukes, lords, baronets, snobocrats, and wealthy esquires. These must be presented to posterity not as they appear in life, but with additions which to their wealth and station are best suited. Meaningless smirks, uncomfortably plain faces, receding foreheads, expressionless features, must be changed by the brush, which does what the camera cannot, inasmuch as it lyngly imparts to canvas a spuriously contrived semblance of intellect and dignity.

Where character exists, and the face of the possessor can show it, photography transcribes intellectual expression with inimitable fidelity; and the masters of photographic art I have named, know full well how to control light, to arrange lines, to compose throughout with harmony and balance; in short, to accomplish everything that can be suggested by experience, artistic taste, and refined culture; and given intellectual models, and not inanimate living puppets on whom to exercise their skill, no painter's hand would succeed in producing more naturally and strikingly the leading characteristics of the persons that form the chief items in each and all of the pictures. In cases where lies have to be registered, the power of paint rules supreme; but if a face is to be transcribed with its lines, its warts, and wrinkles added to whatever of mental power is indicated by the form

of each feature, photography can and does produce such works which painters might utter pooh! pooh! at, but their skill would be at fault if the hand essayed imitation. I have at this moment in my mind's eye, portraits produced under the guidance of a Saloman and Blanchard, beautifully drawn marvellous faces, skilful distribution of light and shade, expression, substance, wondrous fidelity. Before such productions "conventional portrait" shows hideous, disgusting; on such, even the great masters of portrait painting gaze with envy, mingled with involuntary admiration. Alas! photographic triumphs end here; it is the apex of its capability, and should be acknowledged as the outer limit of its means of satisfying ambition. Photography has its mission—it transcribes more faithfully than human hand could do the work, and to a limited extent it interprets the wishes of the producer. But it does not, cannot, usurp the place occupied by the masters of hand-painting, because these can cause the workings of their minds to guide the brush or pencil which registers on blank canvas his thoughts as readily as an author describes imaginary scenes and characters with his pen, his ink, and his paper. Photography as a reproducer of hard facts should rigidly adhere to realities, and when it is seen that the followers of the art claim no more than their legitimate due, the feelings of distrust which so long have blinded the judgment of art critics will slumber, and in their critiques on matters affecting our art they will ultimately adopt a just course, and thus will assist in raising the character and status of photography.

Photographs have sometimes ranked with impositions simply because photographers, unknown to themselves, are sometimes impostors, who delude themselves with ideas that their compositions class with high art, when, in the eyes of discerning observers, those productions intended to class as sublime are more nearly allied to the ludicrous. It is, however, an encouraging fact, that as years roll on, ambition is more and more prone to keep within sensible limits, and it is chiefly on that account that the claims of the art are admitted as genuine, because experts in art are not slow to perceive that photographers, as long as they keep within bounds, are fully entitled to praise, because of the aid they have given in enlarging the knowledge and technical skill of the painter. To have it admitted that the revival of the art of portrait painting is due to photography is an acknowledgment we have good reason to be proud of. And photographers, if true to themselves and their art, will doubtless gain a position of which they need not, as now, be ashamed, when it is said, "Oh! he is only a photographer."

TOPOGRAPHICAL PHOTOGRAPHY.

BY D. WINSTANLEY.

OF the momentous changes which the stealing hand of time effects slowly—very slowly, to be sure—but with a certainty and completeness from which there is no appeal, many are of a kind of which in their various stages photography (to use an alliterative phrase) may make most masterly memoranda.

The pictures of ancient Liverpool, recently exhibited in that town, and, as I understand, now published by a local photographic firm, are of greater interest to others than those residing near the place, illustrating as they do the wonderful alterations effected in specific localities by the extension of civilised life. The site of St. George's Hall—a colossal modern pile, with ponderous cornices and massy columns—was but a little time ago the location of a rustic residence of the inter-timbered style characteristic of the architecture of a bygone age. Where we have now what may be described as a floating street leading to what before the fire was the finest landing-stage yet built, Messrs. Vandyke and Brown's reminiscence of the past shows it to have been a spot dedicated to the use of bathing vans.

And so, in the neighbourhood of every rising town, changes are going on which must at any rate be of interest to the local antiquarian, and which I would urge upon photographers to record, although the negatives of such subjects may frequently have little to recommend them from a pictorial point of view. The changes brought about by time, unaided by the hand of man, are, however, often so startling in their kind, that their photographic representation must inevitably prove of the very highest interest to those who follow after us.

No one, for instance, can visit the islands in the British Channel without being impressed profoundly with the changes that have made them as they are, and I cannot better illustrate the desirability of representing changing nature apart from her pictorial aspects, than by a reference to those interesting events which have separated Jersey from the Continent within historic times, and altered the coast of Brittany within the memory of living men.

From a work, "*Les Mouvements de la Mer*,"* it appears that "in the Gulf of Corduan, at the mouth of the Gironde, the sea has advanced 730 metres in eight-and-twenty years," and now flows more than ten yards deep over what a while ago was but a sandy beach. The bay of Douarnez is the site of a once flourishing city. When the tide is low, druidical remains, altars, and monuments, may be observed beneath the waves, whilst groves of elms, it is recorded, have been seen disposed with a regularity which shows a plantation once was there.

From the summit of Mont Orgueil Castle, near the town of Gorey, on the eastern coast of Jersey, may be seen to-day the mainland of Coutances (with its white cathedral spire), stretching in loveliness against the distant sky, and with many wide miles of water rolling in the space between. From manuscripts and an ancient map in the monastery of Saint Michel, it appears that thirteen centuries ago the separation was effected by a rivulet bridged by a single plank, which the inhabitants were bound to keep in a condition of repair for the passage of the archdeacon of the church on his annual round.

The cause of which these extraordinary changes are the effect is the sinking of the land, the reverse of which is taking place both north and south around the poles. About the coast of Brittany this subsidence is progressing at the rate of about two yards per hundred years. Should this continue for another thousand years, "the peninsula of Cotentin will become an island, and the ports of La Manche be destroyed," and in a period less than half as long as that during which the pyramids have braved the ravages of time, Paris itself will be engulfed beneath the Atlantic wave.

UTILISATION OF RESIDUES.—No. II.

BY PHOTO-CHEMICUS.

WE now come to the treatment of the development waste, and in connection with this part of our subject it is surprising how little photographers appear to know its value, and seem to consider it as a small quantity of silver, mixed up with a large amount of impurity and useless matter. This is really by no means the case.

The decompositions which ensue on the addition of iron to nitrate of silver are theoretically rather complicated, but for practical purposes it is sufficient to say that the precipitate in the process of developing consists of metallic silver in combination with iron. If this precipitate be collected and placed in a wide-mouthed bottle, and treated with diluted sulphuric acid till no more be dissolved, the residue when melted will consist of silver only.

FIXING SOLUTIONS.

The hypo or cyanide after use cannot have the silver separated by salt in the form of chloride, but we are com-

* By Mons. Quenault, *Sans Effet de Coutances*. See also *Nature*, vol. i. page 361.

pelled to adopt another expedient, and precipitate it in the form of sulphide, by adding to the solution sulphide of potassium, or, as it is commonly called, liver of sulphur. There are one or two amusing facts connected with this process which are worth mentioning. The first is, that in America it has been made the subject of a *patent*. To show the utter absurdity of this, we may just mention that long before photography was even heard of, the use of sulphides for precipitating most of the metals was one of the simplest and best known facts in chemical analysis: indeed, its use is at the very foundation of analytical research for separating the various metals into groups; and to show how absurd such a claim is, we may remark that if a photographer sent some old hypo to a chemist, and, without his knowing what it was, asked him to separate the silver it contained, he would in the ordinary course do so by this means; while if the photographer did it himself, he would be liable to an action for infringing the patent. How our "cute" cousins can tolerate the exclusive working of a process which has long been public property is, as Artemus Ward would say, a "goak" of the richest character.

The next amusing point is, that on talking to a photographer lately as to the amount he received for his "waste," when he came to his hypo residue he told us, "Of course I don't get much for this, because it contains very little silver." Now, how does the matter actually stand? Reverting to our "combining numbers," it will be seen that silver is 108, sulphur 16, so that, in fact, nearly seven-eighths of the weight of the precipitate formed on the addition of sulphide to old hypo consists of silver, or would do so but for the circumstance that some excess of sulphur is likewise deposited, which excess could easily be burnt off in an iron ladle, leaving the sulphide of silver nearly pure.

To those with a very little practical knowledge of chemical manipulation the conversion of this, together with the ashes from paper, &c., into nitrate of silver would be by no means difficult; but we think that this process could be better performed on the larger scale by the practical refiner. We have no wish to interfere with his legitimate business. We know that as a class they are men of probity and honour; but in their profession, as in other professions, there are many black sheep who take advantage of the ignorance of their clients, and fix their own value, from which there is no appeal or redress.

If those of our readers who are inexperienced in this matter are enabled by our details to form for themselves a reasonable calculation of the value of their residues, and thus protect themselves—at all events to a great extent—from loss, we shall feel that our trouble has been well repaid.

DRY EGG ALBUMEN.

BY DR. J. SCHNAUSS.*

Egg albumen is, with collodion, the most frequently employed organic body in photographic manipulations. It is, as everybody knows, used in large quantities for coating paper for printing, and to this circumstance is, no doubt, due the fact of the increasing price of eggs, so that we are all of us on the look out for a substitute for albumenized paper. Every photographer would—especially if it obviated the many defects which such paper is liable to—be glad to meet with a substitute of this kind. We have not, however, got quite so far yet, and albumen may still have a long era before it; indeed, for years past the consumption of albumen in photography for one thing and another seems to have been on the increase.

To the photographer, therefore, it will be very handy to have albumen of uniform quality—as good as that from fresh eggs—in a dry state, ready to hand at any time, it being merely necessary to dissolve the dry material in a certain quantity of cold pure water. Such an albumen

is now prepared commercially, the yolk, as well as all its good properties, being dried and preserved separately. The importance of this product cannot be valued too highly, and its preparation is still surrounded by difficulties, owing to the easy decomposition of the egg-oil, as it is a question of preparing an article of food, and not merely a technical product. Eggs may be preserved in many ways unchanged in the shell, but must, of course, by reason of their fragile character, be well cared for.

The dry albumen is prepared both in sticks and in powder. It is easily dissolved in distilled or ordinary water; the solution is, however, in the first place turbid and full of flocculent matter, and requires to be beaten up and allowed to stand for some time, just like ordinary fresh white of egg, in order to clear it. When the liquid under the scum is poured off and diluted with water, for employment as a preliminary substratum for plates, and a drop or two of ammonia has been added, the albumen solution can be filtered perfectly clear with ease, even through good filter paper. In the latter case I have remarked that the filtering goes on much more rapidly if a uniform current of air is allowed to fall upon the liquid in the filter. In this way the solution is kept agitated, and the deposition of matter is prevented, and, consequently, the filter is not choked up; indeed, this is a good measure to adopt in the case of all thick fluids that are difficult to filter. The funnel and filter-paper must, of course, be large enough for the purpose, so that any bubbles that are formed do not rise above the paper. The current of air may be arranged in several ways—for instance, by means of a gasometer, whose exit tube is connected with a glass tube that is allowed to dip down into the middle of the liquid in course of filtration. The power of the current is regulated by the tap. This method is only applicable to aqueous solutions, for such as are easily evaporated—collodion, for example—cannot be treated in this way.

If the albumen solution is filtered through wet sponge, or through linen, its clearness is by no means perfect, and strong solutions cannot, unfortunately, be treated in any other way. It is worthy of note that the dry albumen, if well preserved in dry vessels, may be kept for a very long time, but solutions appear to become decomposed much sooner than that prepared from fresh albumen. As, however, a solution can be prepared at any time, the matter is of little importance.

It is easy to prepare the dry albumen oneself, if such a course should appear desirable. Raw white of egg is beaten to a stiff froth, and then allowed to desiccate spontaneously in flat dishes at a temperature of 15° to 18° Reaumur. It is necessary that the albumen should be well protected from dust or other particles falling upon it, and this is very well accomplished by the film of froth above becoming dry and hard. That a dry locality is necessary for the operation need scarcely be said. The glassy, brittle mass of dried albumen is very easily powdered. On dissolving the albumen powder in water, it is necessary to see that it does not cake together, and it is well, therefore, to sprinkle the powder gently into the water while this is being stirred. The preparation of a solution is therefore rather a long operation.

Commercial albumen powder should be provided with a label, stating the amount of water necessary to produce a solution of the same consistence as fresh white of egg; then it would be easy to calculate the degree to which it must be diluted for the various purposes of the photographer.

Correspondence.

DEVONSHIRE SCENERY.

SIR,—I left off my last letter just as we had got down on the little pier that protects the trawlers and the base of the village of Cleavelly from the destructive effects of the N.W. gales. I forgot to say, that before I got there on the last occa-

* *Photographische Archiv.*

sion, my assistant and I were nearly placed *hors de combat*. I mention it as a warning to any brother photographer who may be going that way on a similar errand. We were just driving down the Hobby, admiring the beauties of the peeps through the foliage, when our pony stumbled on a loose stone, and fell, pitching us both out of the trap with our outfit. Though not seriously injured, our nerves, as well as our chemicals, were so severely shaken, that it in all probability spoiled several negatives that otherwise might have been good.

It will be seen that Clovelly Pier, built by Sir John Cary in the time of Richard II., of huge boulders, of the same character as are scattered on the beach, forms a picturesque object of itself. Three or four negatives can only fairly represent its peculiar character and construction. In 1820 a portion of it was extended after a terrible calamity happened to a score of fishing boats in the bay. A good general view from the pier, and also from the beach, with a wide-angle lens, should be taken, as it takes the whole village, and shows the peculiar character of the cottages rising one above another. Then one or more negatives should be secured of "Mased Katie's Cottage." This is a favourite object for the artist, taking in the hills, the distant waterfall, and the sea. There is a sad history also connected with it, to which our postman poet, Cspem, has given expression, in a poem of touching sadness, under the above heading, and in the following lines:

"Under the cliff by the western shore,
Wandering ever, went she,
Looking for one she will never see more,
In the little cove down by the sea."

If Clovelly could be photographed from the sea it would make the best picture. The street, both up and down, should be taken. It is only within the last few years that it has been supplied with anything like stone steps. It was paved with the boulders of the beach, and was betide him who was not well on his feet in wet weather! A view should be taken from Mount Pleasant, as it gives the character of the singular village. The church should be taken, both the exterior and interior (the latter I have not seen done), because it has some beautifully formed pillars. The Court House is always photographed, but as it is a modern building, erected on the old abbey burnt down, it has not much to commend it beyond being once the residence of the sole proprietor of the whole village.

After photographing these objects, you pass through grounds of the most lovely and picturesque character to Mouth Mill, a guide being supplied you. There are several noteworthy objects of which a picture or two should be secured, such as the Wigwam, Grey Rock, Gallantry Bower (which is a perpendicular rock, beautifully veined, three-hundred feet in depth). This can easily be done from above, with the sea below. Mouth Mill is very interesting, and it has a remarkably large rock, severed by some convulsion of nature from its fellows, with a cavern right through it, and is known as Black Church Rock. There are also the limekilns and the old mill, with the gurgling stream passing over its bed of boulders. Each and all can be made a good picture, and will repay the trouble of photographing.

I have by no means given all the interesting bits of Clovelly, but the objects mentioned, if well done, will sell commercially.

We pass on to Hartland, which is about six miles; but, as there is nothing of particular note in the village, we pass on to the Abbey. We see at a glance that the monks of old were wise in their generation, for a more lovely valley could not be conceived for placing a monastery. Sheltered and deeply wooded on either side, with a trout stream meandering by, a path at the rear, where the deer wander, no wonder if they did sing:—

"Here would my willing soul stay,
And sing itself away to everlasting bliss."

There, however, is the Abbey, with the lofty church tower rising in the rear; and a splendid picture it makes. The building has been modernised. The cloisters of the old

abbey form the basement of the eastern and western front, both of which should be taken. The church, which is near by, is well worth three or four negatives. It has a splendid lofty tower, and in the interior it has a very ancient screen. The church is dedicated to St. Nectan, and was famous at one time as containing the relics of that holy man. About a mile from this spot is Hartland Quay, where there is a fine opportunity to take in more sea views. The rocks here are grand, being both massive and precipitous, and are beautifully veined. A half dozen negatives taken would well repay the labour. A couple of miles further down is Hartland Point, well known both to ancient and modern seamen as a very dangerous promontory. The lighthouse now lifts its beacon of warning on it, and as the point has never been photographed, it would be doubly interesting to do so now. Between the Quay and the Point is also a magnificent waterfall, well worth a plate or two. The principal reason why Hartland Point has not been photographed has been the difficulty of getting there; but this is now removed by going there by the Trinity Road to the lighthouse.

I have now done with this part of the coast, and next week I shall say something of Ilfracombe and Lynton.—
Yours respectfully,
THOS. TEDRAKE.

DEAR SIR,—I believe your readers will agree with me that a guide likely to prove of service to photographic tourists should be written in an unbiased and comprehensive manner, treating generally and fairly of the entire district of which it professes to speak, and not confined to a florid description of a small portion only, as this would read too much like an advertising puff of some speculative hotel company. It would be useless to attempt giving a particular description of all the various objects of interest contained in an area of some two hundred square miles, as this would require more space than could be afforded in such a work as the PHOTOGRAPHIC NEWS. A residence in this beautiful county of between thirty and forty years, principally in its Northern districts, enables me confidently to state that over the entire county are scattered objects of interest of almost every description worthy of the photographic tourist's notice; but provided his preference inclines to bold and rocky scenery, he will find this in its most sublime aspect in North Devon.

Great improvements have lately been made as to the convenience of transit, and to a London tourist there are now three lines of route open, each having its terminus at Ilfracombe, with branches to other places. The first would be from London to Exeter, thence to Barnstaple, thence to Ilfracombe per rail throughout. The next route is from London to Taunton, thence to Devon and Somerset, rail to Ilfracombe, saving distance and expense to the extent of forty miles. The third route would be from London to Taunton, thence to Minehead, thence per coach to Lynton, thence per brake to Ilfracombe. But should the tourist be a stout pedestrian, fond of wild moorland and river scenery, fishing, or peeping into out-of-the-way and secluded places, he can leave the stage at Portlock, and diverge from the main line of route to Dulverton, or North Molton. Should he proceed direct he will reach Lynton and Lynmouth. The scenery of these places comprises rock, wood, and water, and in its own peculiar style rivals, if not excels, that of any other place in North Devon. The tourist having entered the district by its Eastern extremity, can proceed with the greatest facility through its whole length, stopping or diverging at various places as he pleases. Passing through Combemartin by the new road through Watermouth, whose giant caves are objects of great interest, the tourist will reach Ilfracombe, where accommodation can be procured suitable to any scale of expenditure. Conveyance by sea and land are readily obtainable by which to visit all parts of the district. As this town and neighbourhood are certainly most central and interesting positions of North Devon, I shall not be doing my duty either to them or the

tourist should I not give them something more than a mere passing notice; I will therefore do so in my next and concluding article.—Yours truly,
JAMES MARTIN.

PHOTOGRAPHING HORSES.

DEAR SIR,—Will you allow me a space in your News as regards the photographing of horses? I will give a plan which I have used with every success. I get a man to shake some oats in a sieve, and so get the horse's attention, then suddenly put the sieve behind his back. The horse will of course look for it, and in that moment take his photograph. I use one of Dallmeyer's C.D.V. lenses (rapid), and enlarge after.—I remain, &c.,
C. R. P. VERNON.

EXPLOSIVE SILVER COMPOUNDS.

DEAR SIR,—There was in the "News" a short time ago a warning against the use of ammonia or other alkali when boiling a silver bath, on the ground that the oxide of silver produced is explosive to a dangerous degree.

As I did not fear much mischief from the small amount of gas that could be liberated, I tried the experiment, using first washed oxide of silver thrown down by potass.

A small quantity was placed wet on some filtering paper, and then held over the hot plate of a gas stove until the paper charred and smouldered away. The oxide of silver darkened in colour, but did not frighten anyone! Afterwards I tried some thrown out by ammonia, and not washed, drying it over a naked gas flame until the paper charred and took fire. In this case also there was nothing suggestive of the fifth of November.—Yours truly,
ED. SEELEY.

Talk in the Studio.

PRECIPITATION OF SILVER BY PROTOXIDE OF URANIUM.—M. Isambert, writing on this subject in the *Comptes Rendus*, says:—"When metallic oxides act upon solutions of silver salts, the action commonly consists in the precipitation of silver oxide, but there may be produced in some cases a deposit of metallic silver. Ebelmen has shown that protoxide of uranium produces in solutions of nitrate of silver a deposit of metal exactly as does copper, one equivalent of uranium replacing one equivalent of silver, without escape of gas. On repeating Ebelmen's experiment, the author finds the final result completely exact. Protoxide of uranium being thrown into a very neutral solution of nitrate of silver, and well stirred, a bulky precipitate is formed, whilst the protoxide dissolves, and the liquid becomes green. On continuing to stir, this colour disappears, and is succeeded by a yellow shade, characteristic of the sesqui salts of uranium. At the same time, the precipitate decreases in bulk and changes its appearance, passing from its original state of oxide to that of metallic silver. Hydrated protoxide of iron, in like manner, produces a precipitate of metallic silver, with formation of sesquioxide of iron. This property of protoxides, of passing to a higher state of oxidation, and of throwing down metallic silver, is shared by their salts.—*Chemical News*.

MRS. PARTINGTON, visiting a photograph gallery recently, asked the proprietor the names of the different style pictures, and was politely informed that they were the "Rembrandt," "Berlin Heads," "Embossed Cameo Vignettes," "Medallion Cartes," "Saloman" photographs, "Victoria" cartes, and "Cabinets," &c. Mrs. Partington called Ike (who was looking at a stereo view upside down) up to the show cases, and pointing to them in the same manner that the photographer did, informed Ike "that's the sunburnt style, that's the burling heads, them's Boss camilla vingarrets, them's meddling cats, that's the Salmon style, them's the victory carts, and them are the cabinet and showforth. I shouldn't wonder if the next unvaluing style will be the vingarrets agin!" adled Mrs. P., looking over her specs. at the photographer. "I should not wonder at all—you are fond of pictures, I perceive, madame." "Yes, but then you know I am only an armytour, but still I am comparatively fond of pictures of extinguished personages.—*Western Photographic News*.

A SILVERING POWDER for coating copper consists of nitrate of silver 30 grains, common salt 30 grains, cream of tartar 3½ drachms. Mix, moisten with water, and apply.

To Correspondents.

IGNORAMUS has deprived us of the opportunity of giving him any information or advice, by great carelessness or lack of knowledge in the packing of his negatives which reached us in a hundred fragments. A piece of glass placed between two pieces of thin board without edges or packing of any kind to keep off the pressure, must inevitably be cracked or broken up into fragments, however carefully treated in transit: each blow in cancelling the postage stamp, adding the post town, date, &c., would produce a fresh fracture. The issue is that our correspondent, by taking insufficient care, has wasted the care expended, and is disappointed of the answer for which he wished, and we have our writing table covered with dangerous minute fragments and spicula of glass, falling out, despite care in unpacking the parcel. To travel safely, negatives or plates of glass must be placed in a box, or its equivalent. If the boards used here had had narrow strips of wood glued or fastened with brads all round the edges of one of the boards, to form a cell or box, and the negative, folded in a piece of wadding, or cloth, or flannel, placed therein, it would have travelled with perfect safety. "Ignoramus" does not say what the nature of the defect is. Let him describe it, and send us a print from a defective negative. We may then possibly be able to assist him.

STUDIO.—We prefer No. 1, which will permit more effective light to reach the sitter. You will find the west a troublesome aspect, we fear, for portraiture, as you will be troubled with direct sunlight during the greater part of the busy time of the day. Curtains sliding on rods will probably be most effectual, and most easy to work. You will probably find a large movable screen covered with tracing cloth or tissue-paper useful in breaking the direct sunlight falling on the sitter, without seriously destroying the illumination.

T. J. ACR.—It is impossible to give special advice for general cases. Almost everything depends upon the size and shape of the interiors, how they are illuminated, and many other conditions, to meet which practical judgment and experience applied on the spot are imperative. If the circumstances admit, a portrait lens with small central stops may be used. In other cases a single lens, with the stop in front placed very near the lens, answers admirably. You will find an article on p. 82 of our YEAR-BOOK for 1872, that furnishes many very useful practical hints on photographing interiors.

SOUTHERN HEMISPHERE.—P.O. order received, and handed to our Publisher, who will attend to your business instructions. Of the lenses that you mark, B will answer best. The general character of your studio appears to be very good. There is nothing better than starch as a permanent means of obstructing the direct rays of the sun without losing much light, as it gives a thin, delicate translucent film; is easily applied; does not soon soil, and is easily removed when necessary. Rembrandt effects are necessarily of a varied character, and require many varieties of lighting. The principle is in all cases to admit a strong direct light through a narrow aperture, and to have means of securing reflected lights in any position by the use of movable screens. There is no "best formula" for portraits or landscapes, as all formulas require at times modifying to suit conditions. The ordinary recognized formulas in common use are the best for general purposes, and these we have published hundreds of times. You can scarcely suppose that we have kept unpublished the "best formula" in order to impart it in an answer in this column. To intensify with chloride of gold, apply the ordinary toning bath used for prints to the fixed and washed negative. A strong solution of chloride of gold will work quicker.

KYBER.—It is possible that the plan of making blinds which you propose may answer; but we are not sufficiently familiar with it to recommend it. We should prefer for the top light, blinds on spring rollers placed at the ridge; and for the side light, curtains sliding on rods. The character of carpet for the floor of studio is much a matter of taste. It should not be too large or pronounced in pattern. Any quiet neutral tint you may prefer will answer for interior of studio. You should never mix up advertising matters or business concerns of any kind with questions addressed to the Editor, as it causes much delay and inconvenience to send the letter to different departments for attention to different portions.

JOHN J. T. GLOVER.—We hope shortly to be able to publish more particulars of Mr. Vander Weyde's clever system of lighting. Thanks for interesting illustrations of curious surgical case.

CAPTAIN TURTON.—Thanks. Will be duly acknowledged in next list of subscriptions. Either of our English opticians will supply the information.

TO ADVERTISERS.—Owing to the pressure on our advertising space the Publishers beg the indulgence of Advertisers whose announcements they are compelled to hold over for the next issue.

Several Correspondents in our next.

The Photographic News, June 11, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. SUMMER TOURS.

It is a mistake to put off one's summer outing till late in the year. We know very well it is fashionable so to do; that the weather is cooler then than in June; and that autumn works such charms upon the foliage as to render the landscape tints more bright and varied than is the case when mere masses of green hang from the boughs, and clothe the country with verdant tapestry. There are the autumn fruits to be enjoyed, and wonderful sunsets to be seen, and a hundred and one other advantages of autumn; but, for all that, we recommend an early holiday, especially to the tourist or traveller going abroad. Photographic apparatus can now-a-days be packed away within such trifling limits, that certainly amateurs have little need to trouble about it, and may go almost anywhere with their outfits without feeling inconvenienced thereby. There is no reason why they cannot avail themselves of all the advantages that ordinary tourists enjoy, for their impedimenta in travelling is very often far less than one sees the fashionable tourist with. A camera, box of dry plates, and even dark tent and chemicals, do not together make up the amount of baggage that some of "Cook's tourists" are wont to carry with them, for it would be a bulky equipment indeed that would not go within the space of an ordinary sized portmanteau, and perhaps a hatbox or two to boot. The Swiss and Black Forest tourist is becoming quite a buck in his way. Many take a dress coat and silk waistcoat with them to appear in at the grand hotels at Interlaken and Baden-Baden, for, in some of these fine hosteleries, it is almost *de rigueur* to appear in a dress suit at table d'hôte. A man in Scotch tweeds or knickerbockers will soon become a rarity in these civilised regions, and a mountain tour will henceforth involve not only hobnail boots and suits of flannel, but a supply of dress shirts, white ties, and lacquered shoes. If you do not come accompanied by trunks and portmanteaus, you are looked upon coldly by the grand *maitre d'hotel* and his satellites, and so replete are they with custom that in *le gros de la saison*, as our French neighbours aptly express it, a modest traveller with a knapsack must needs beg and pray to be taken in. It is not a question then of getting bed and supper at a moderate rate, but to get one at any cost, and the exorbitant sums demanded, and of course obtained by hotel proprietors, frequently cripples one's finances, so much so, perhaps, as to compel you to shorten your tour, or forego it the succeeding year. In the season, in Switzerland, the prices rise with the demand. *Point d'argent, point de Suisse*, is a saying most people have heard, and many know the meaning of. On the Rhine, at the German Spas, in Scotland, the English lakes, or wherever you turn, matters are no better in the usual holiday time, and this is one of the main reasons why we advise those who can to take their holiday early. Although the photographer may lose some effects by not waiting for the autumn, he is not so trammelled as the painter in this respect, and the charming undergrowth in woods and dells, the ferns and forest flowers, are as pretty in June as they are three months later. Then there are such glorious long days about this time of the year, which must certainly not be forgotten on the side of summer, and if the traveller should be troubled with a few very hot mornings he must remember that in September and October one is apt also to be unfortunate, and to come in for a slice of dull November weather, or cold wintry rains, that bring the red leaves down in shoals, and sodden the ground for days together. In early summer he is comparatively undisturbed by other tourists; he does not find the inns and hotels filled to overflowing, but the landlord is glad to have him, and looks after him with care and attention, such as he could not secure later for love or money. When he visits this place or that, he does not find nature spoilt by

crowds of visitors, giving an air of cockneyism to everything he sees, and this freedom from groups of tourists is the thing of all others which the landscape photographer desires.

Robinson, in his work on "Pictorial Effect in Photography," has pointed out how a pretty rustic landscape may be altogether spoilt by the introduction into it of a portrait unsuited to the scene—a finely dressed dandy in a country lane, for instance—and many of our readers may have seen how the poor artists at Bettws get badgered by tourists in all sort of costumes, who take up positions in the Fairy Glen on the Conway, straight in front of the painters' canvasses. It is generally considered a very funny thing on the part of tourists to plague a painter or photographer when earnestly at work, and the latter is especially at their mercy, for with him the picture depends upon securing a few moments' favourable lighting after he has drawn the slide. Thus both a saving of worry and anxiety, as also of money, is generally effected by those who travel in early summer, and as everybody takes an outing now-a-days, and wants to be as fashionable as he can, quitting town at the right moment, when Parliament is up, and coming back again just when the theatres and the winter exhibitions are commencing, it follows as a matter of course that hotels and inns in tourist districts are strained to their utmost during this brief period. In June you may go to the most charming spots on the Lake of Lucerne, in the Engadine, on Windermere, in North Wales, on Loch Lomond, and make arrangements to stop a week or ten days at a comfortable hotel for a moderate amount, while later on not only will they refuse to listen to any bargain you desire to make during your stay, but you may consider yourself fortunate to get taken in under any circumstances. One more hint to those going abroad. Travellers who can speak the language of the country they are visiting, or at any rate are sufficiently familiar with it to get on somehow, have, of course, great advantages over those who must perforce trust themselves to Cook, or Gaze, or other of the excursion agents. It is a good plan when you have fixed on your route, and calculated the expense of travelling over it, to consult the "circular tours" which almost every foreign railway issues tickets for in summer. Cook's *Excursionist* contains a number of these "circular ticket tours," which oftentimes may be used to advantage; and in like manner every railway company pretty well, in France, Germany, Switzerland, &c., have their own tours. *Hendeschel's Telegraph*, the German Bradshaw, contains several closely printed pages of these tours, and when an intending tourist has sketched out his route, it is very likely he can get one of these plans to suit him, in which case he may take a ticket at a very reduced rate. We will give one illustration of this. Supposing you desire to visit the Pyrenees: you go to Paris, and then find that a second-class ticket to Bayonne will cost you between two or three pounds; then come sundry railway fares to help you on your way across the mountain range—say, as far as Toulouse—and then the journey back to Paris. In this way the cost of the railway journey from Paris to the Pyrenees and back would amount at least to seven pounds; and yet a circular ticket, first-class, out and home, which you can use or not, just as you like, when you get among the mountains, can be had in Paris for three pounds, a sum which would not take you there and back third-class. So from Cologne, from Frankfort, from Berlin, and from scores of other places, circular tickets are issued through interesting districts, and those of our readers who are meditating a foreign tour this summer will do well, therefore, to study these before making definite arrangements.

A NEW DRY PROCESS.

MR. CAREY LEA gives, in the *Scientific American*, the following details of his most recent modification of the emulsion process, of which he appears to think very highly. He says:—

The method gives, by simply pouring an emulsion over glass, not only a high, but I may say an intense, sensitiveness. Moreover, by virtue of the silver iodide which they contain, these plates need no backing. They develop with great rapidity, and need no intensifying, so that the whole operation, from first to last, is reduced to the most absolute simplicity. The advantages in the way of facility of management and the high degree of sensitiveness are such that I should not be surprised to see these dry plates largely supersede the wet process; in fact, a beginner will more easily work this dry method than the wet when the emulsion is to be obtained commercially, which it soon will be, as I do not propose to place any restriction upon its manufacture by any one who may choose to prepare it.

Collodion.—To each ounce of solvent, consisting of alcohol and ether in equal parts, take ordinary crystallized cadmium bromide, six and a-half grains; ammonium bromide, two grains; ammonium iodide, one and a-half grains; cupric chloride, one and a-half grains. About eight grains of intense pyroxylin to the ounce, with two drops of *aqua regia*. Sensitize with silver nitrate, using from twenty to twenty-five grains to the ounce. The first-mentioned quantity is excellent for ordinary work; when a very high degree of sensitiveness is desired, the larger quantity may be used. For the reason that the emulsion is to be dried, some economy may be practised by making a more concentrated emulsion, as follows:—

Ordinary cadmium bromide	...	9 grains
Ammonium bromide	...	2½ "
Ammonium iodide	...	2 "
Cupric chloride	...	2 "

Use about ten grains of intense pyroxyline. The silver nitrate must be increased in the same proportion as the salts, so that twenty-five to thirty grains to each ounce of concentrated collodion will be proper. Three ounces of this collodion will, after treatment, give four ounces of finished emulsion.

The best results are obtained by keeping this emulsion, with occasional shaking, for from twenty-four to thirty-six hours. It is then to be poured out into a flat dish and allowed to set. Particular care is needed in this part of the operation; the preservative must be applied just at the right time—neither too soon nor too long after the pouring out. The emulsion must be occasionally examined, and moved about in the dish to promote equal drying. As soon as a skin forms on it, holes must be made through it, and the collodion underneath be made to flow out and over it. If this be neglected, the surface will become hard and leathery before the emulsion is set underneath. The object is to keep the whole mass as nearly uniform as possible, and, as soon as it is gelatinous, to apply the next treatment. The proper condition can be judged of by touching with the tip of the finger; as soon as nothing comes off upon the finger, the emulsion is ready for the preservative.

Any preservative may be used. As to the effects of different preservatives, I will speak presently. If the lesser quantity of silver be used, the preservative may generally be applied in its ordinary condition; but if the larger, then it will be well to add to the preservative one-tenth of its bulk of ordinary acetic acid (No. 8 or Beaufoy's).

The preservative is to be poured into the dish, and then immediately the film is to be ploughed up with a porcelain, horn, or glass spatula (not a metallic one), and reduced into small pieces; and the whole, preservative and film, is to be transferred into a convenient glass jar—not too small. The flakes of emulsion are to be occasionally stirred, and left in contact with the preservative for fifteen minutes from the time when it was first poured over the mass. (In operating upon a large scale, commercially, it will probably be found better to leave a little longer in contact with the preservative, and always to acidify. For working with a few ounces, the foregoing is the right way.) The preservative is then poured off, and water

poured on, the flakes well stirred up, and the water changed several times. The flakes are then left to stand under clean water for about an hour; then several more changes, then stand another hour; then several more changes. By this time everything soluble is extracted from the flakes; indeed, after the first hour no silver can be found in the wash water. We have now only to dry. This may be done at ordinary temperatures, or the vessel may be set over a stove, provided its bottom be not allowed to become hotter than the hand can bear. The drying must be thorough; the flakes shrink wonderfully, and curl up like tea leaves. They are not white, but of a medium grey colour, notwithstanding which they make a pure cream-coloured emulsion.

To re-emulsify, the dried flakes are put into a bottle, and are covered with one-third ether, one-third alcohol, and one-third plain collodion. They must be well shaken at intervals. The new emulsion is not in good order till after at least forty-eight hours, and is better at the end of a week. When it has once been thoroughly mixed with the liquids, and has been shaken at intervals for some days, it seems to lose all disposition to settle, and makes a most excellent emulsion. There is no reason why it should not keep indefinitely. Or it may be preserved in the dry state, and emulsified at any time, using from twenty to twenty-five grains of the dry emulsion to each ounce of solvents. Three-and-a-quarter ounces of collodion, formula No. 2, will yield about one hundred grains of dry flakes.

PRESERVATIVES.—The character of the image will depend very much upon the preservative used.

Albumen Preservative.—This gives an exceedingly sensitive and delicate plate, with much less density than most of the other treatments. For this reason I prefer it to the rest, as tending to give detail in both lights and shadows, with great varieties of half-tone. My formula is—

Water	...	12 ounces
Thick gum and sugar solution	...	1 ounce
Prepared albumen	...	1 "
Sixty-grain alcoholic solution gallic acid	...	1 "
Sixty-grain tannin solution (in water)	...	½ "

To be added in the order named. If rather more density be required, double the tannin. I use it as above. This preservative works very cleanly and satisfactorily. I use it exclusively.

Gallic Acid and Coffee.—A mixture of gallic acid and coffee, using about two ounces of sixty-grain solution to twelve ounces of infusion of roasted coffee, gives very good results; it should, however, be acidified with acetic acid, using about half-an-ounce of Beaufoy's (No. 8) to the above quantity. It gives a blacker image than No. 1, and more intensity. It will probably be useful when the pyroxylin is deficient in intensity. It gives excellent transparencies by exposure under a negative, but too intense for lantern work, for which No. 1 is much better, as well as for negatives.

DEVELOPMENT.—For a 6½ by 8½ plate pour four ounces of water into a 7 by 9 dish, add half a drachm of sixty-grain solution of pyrogallie acid in alcohol, and put in the plate. Mix in a bottle equal quantities of a fifteen-grain solution of potassium bromide and an eighty-grain ammonium carbonate. Of this mixture pour one fluid drachm into the dish. When the detail appears, add another drachm, and later, if necessary, a third; or add half a drachm of the ammonium carbonate solution without bromide. The two first additions must have bromide; the third is best without for a negative—best with for a transparency. Fix in the hyposulphite solution of the same strength as used for wet plates.

I should have mentioned that I always keep the collodion for a month—for several, if possible. The plates should be edged with a solution of india-rubber in benzole.

The principle of applying a preservative to a mass of material at once, and then washing it out again, could be patented. This is common to the new processes. The plan of applying a silver bath to a mass of partially dried collodion is also new and patentable. Convinced as I am of the very great usefulness of these processes, I believe that such patents would be very valuable. I prefer, however, to give them freely to any one caring to use them, asking only, in return, to have them ascribed to their author, and not appropriated by those who may make trivial modifications on them.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER VII.

REDEVELOPMENT, AND INTENSIFICATION.—THE FIXING SOLUTIONS.—VARNISHING.

Redevelopment and Intensification are corrective measures; properly lighted, exposed, and developed, the negative should not require either of these manipulations to produce the required effect. The difference between these two methods may be thus described. Redevelopment is a second application of developer, or a solution of pyrogalllic acid and silver, before the negative is fixed, for the purpose of bringing out further detail, which the development has failed to do; while intensifying or "strengthening" is the application of the pyrogalllic acid solution and silver to any extent, after fixing the negative, tending only to strengthen the image already formed on the plate, and having no effect in bringing out any further detail.

As I have said before, these methods should not be resorted to unless, from some cause, you are unable to get sufficient time of exposure on the plate, as in the case of a child or nervous sitter, or from the weakness of the light. With your bath and collodion in proper working order the negative should grow under development to a perfect density. If your negatives come up uniformly weak and thin, and you know the lighting is good, and have confidence in your sensitizing solution, weaken the developer a little with water, adding a drop or two of acid.

In the case of a negative being too thin or weak—that is, lacking sufficient contrast between the lights and shadows—it may be strengthened in various ways, either before or after it is "fixed."

If it is found necessary to strengthen before fixing, the negative should be thoroughly washed, and flowed with a small quantity of a solution of

Pyrogalllic acid	40 grains
Citric acid... ..	40 "
Water	30 ounces

Pour a little of this solution into a small glass or graduate similar to that used for the development; pour the solution over the plate two or three times, covering it in every part, draining it back into the glass, not to waste it; to this add a few drops of a 20-grain solution of silver (in water), and with this flow the plate until the desired density is gained, or the solution turns "muddy." If it arrives at that state before you have accomplished your purpose, in which case wash the negative again thoroughly, and repeat the application, first the pyrogalllic acid solution, then with the silver added. The reason for first flowing with the acid is that thereby stains, which would be sure to appear if first flowed with the silver, are avoided.

If, after Fixing, it is found necessary to intensify the negative, great care must be taken to thoroughly wash off the hyposulphite of soda, as its presence causes bluish stains and streaks. This carefully done, proceed to strengthen with pyrogalllic acid and silver, using the pre-

cautions before described against streaks. This operation of strengthening after fixing the negative has the tendency to change the colour of the film to a bluish hue, but the colour better adapted to printing purposes, of an olive brown, may be restored by placing the negative again in the hyposulphite of soda solution after thoroughly washing off the intensifier. Thoroughly wash away all traces of hyposulphite of soda.

While the process of redevelopment or strengthening before fixation of the negative must be conducted in non-actinic light, and before the negative has been so exposed after development, because actinic light has still an influence on the iodide of silver, it is not absolutely necessary with the intensification of the fixed image, a weak diffused light not affecting the deposit of silver.

Where the negative is of a subject white and black, as copies of engravings, printed matter, manuscripts, &c., sulphuret of potassium or bichloride of mercury and ammonia are used as intensifying agents. Permanganate of potassium, tincture of iodine, &c., are also sometimes used as intensifiers.

To Strengthen with Sulphuret of Potassium.—Strengthen the negative before fixing as before described with pyrogalllic acid; fix and wash the negative thoroughly. This will not be sufficient, as you want the whites of the negative perfectly opaque. Take in your developing glass a piece of sulphuret of potassium of the size of a common marble, filling the glass with water; and, without waiting for it to dissolve, flow it over the plate; continue this, the solution gaining strength as the sulphuret dissolves. The plate will now gradually assume a purplish black hue until the required intensity is gained. The reason why the sulphuret is not allowed to fully dissolve before beginning the intensification is, that its action would be too rapid to allow the operator to flow the plate without causing streaks and stains.

The objections to the use of sulphuret of potassium are such as almost to nullify its virtues as an agent for intensification. In the first place, negatives strengthened by it cannot be kept in a state of preservation long, owing to the decomposition of the sulphuret of silver which is formed in the film; secondly, it can only be prepared in solution at the very moment of use; and thirdly, the smell of sulphuret of potassium is so offensive that some operators cannot use it at all. Rather grave objections, you will say. They certainly are; but still the sulphuret is at times very useful as a rapid and sure intensifier.

To Intensify with Bichloride of Mercury and Ammonia.—Strengthen the negative with pyrogalllic acid and silver as before described, wash, and fix, and again treat it to a thorough washing. Now flow the plate with a saturated solution of mercury in water, 1 part to 6 parts of water. (When a liquid has dissolved as much of a solid as it is capable of doing, it is termed a saturated solution. Therefore you will understand by a saturated solution of bichloride of mercury that the water in which the bichloride of mercury was dissolved has taken up as much as it was capable of doing.) Continue to flow this solution on and off the plate till the image, first turning to a greyish colour, gradually grows lighter until it becomes nearly white. Wash the plate, and flow on a weak solution of aqua ammonia 1 part and water 8 parts. Gradually and cautiously increase the strength of this solution by adding ammonia. The plate will now darken until it grows perfectly opaque and black.

(To be continued.)

A NEW AND SIMPLE METHOD OF RECOVERING SILVER FROM HYPOSULPHITE WASTES.

BY JAMES CHISHOLM.*

In the *Bulletin* for April, 1874, I communicated a short method of recovering silver from hyposulphite of soda

* Read before the Photographic Section of the American Institute.

The Photographic News.

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SULPHOCYANIDE FOR FIXING.

HYPOSULPHITE of soda has been at once one of the greatest boons and the greatest banes ever introduced into photography. If hyposulphite of soda as a solvent of silver salts had been known earlier, it is probable that photography as a practical art would have been many years older than it now is. Sun pictures, as is well known, were produced at the commencement of the present century, but, for want of the knowledge of a fixing agent, no enduring results followed the early experiments. In the earliest works of Talbot and Daguerre, the fixing agents employed were very imperfect. Daguerre if we remember rightly, used a strong solution of common salt, whilst Fox Talbot used bromide of potassium. Sir John Herschel's introduction of hyposulphite of soda at once banished all other imperfect solvents of silver salts, and became recognized as the fixing agent, *par excellence*, a position which it has maintained to this day. It has been the subject of almost unlimited oburgation and denunciation, but it has never been superseded.

The avowed object of Mr. Hooper's paper, read at the meeting of the Photographic Society on Tuesday evening, was to aid in superseding it by the use of sulphocyanides as fixing agents. In answer to a challenge as to his own practical experience in the use of the sulphocyanides, he distinctly avowed that his aim was rather to stimulate experiment and enquiry than to state his own limited experience. The evidence he had collected from the statements of the gentlemen who a dozen years ago urged the use of sulphocyanides in fixing seemed most satisfactory and conclusive as to their superiority to hyposulphite of soda. It only required to be manufactured on a larger scale and at a cheaper rate to meet every desire of photographers. Mr. Spiller followed, and in a brief paper pointed out the facility of producing it as a by-product from gas liquor at a cheap rate, so that, instead of costing, as at present, three or four shillings per pound, it might be produced to sell at three or four pence per pound. With somewhat of caution and hesitation, he said, in answer to the President, that he thought it was a better fixing agent than hyposulphite of soda; but he had not had much practical experience in its use. The call for the results of practical experience, repeated more than once on Tuesday night, did not, unfortunately, meet with any response, and no practical information was forthcoming. We can, however, to some extent supply the omission.

When, a dozen years ago, sulphocyanide of ammonium was introduced by Mons. Meynier, of Marseilles, as a fixing agent, to supersede hyposulphite of soda, the claims made for the new fixing salt were so attractive, that we gave considerable practical attention to the subject, our experi-

ments extending over many months. The claims put forward gave it, if verified, a right to supersede both cyanide of potassium and hyposulphite of soda at once. It was stated to be as active as cyanide of potassium, and as easily removed by washing. Unlike cyanide, it did not attack and dissolve the image when it had completed the fixing; and unlike cyanide, it was not poisonous. It was alleged to fix more perfectly than hyposulphite, and to be much more easily removed by washing. Unlike hyposulphite, it did not form insoluble salts with silver, if the fixing solution were too weak; and unlike hyposulphite, it did not readily decompose, and liberate sulphur, to the detriment of the prints. These claims, generally, we found borne out by practical test, and hence at first it appeared that the millennial of silver printing had arrived.

But there was another difficulty: a difficulty which will, we fear, unless some new discovery remove it, be absolutely fatal to the idea of adopting the sulphocyanide in place of hyposulphite for fixing. We must state this as clearly as we can consistently with brevity. To make the matter clear, we must first describe the property which makes hyposulphite of soda so valuable as a fixing agent. When a silver print is first immersed in a bath of hyposulphite of soda strong enough for fixing purposes, the chloride of silver and nitrate of silver present in the print are converted into a double hyposulphite of silver and soda, which is absolutely soluble in water. Hence, by long washing, this double salt of silver and sodium, being so soluble, is gradually removed, and when the operation is properly performed, the perfectly fixed and perfectly washed print may be fairly said to be permanent. But when sulphocyanide of ammonium, or other base, is used for fixing, the reactions, generally similar, vary in their issue. The print, on being immersed in the sulphocyanide bath strong enough for fixing, undergoes at first a similar change to that effected in the hyposulphite bath, a double sulphocyanide of silver and ammonium being formed. This salt is perfectly soluble in solution of sulphocyanide of ammonia, but it is not soluble in water. Hence when the print, duly fixed in the sulphocyanide, is removed to water for washing, the double sulphocyanide of ammonium and silver in its texture cannot be perfectly removed by washing. This double salt, instead of being dissolved by water, is decomposed by water into sulphocyanide of ammonium and sulphocyanide of silver. The sulphocyanide of ammonium, being soluble in water, is removed, and the sulphocyanide of silver, being insoluble, remains in the print. To obviate the difficulty involved by this fact, it was proposed to use two fixing baths. After first fixing, and washing for a short time, the print, still containing insoluble sulphocyanide of silver, was immersed in a fresh bath of sulphocyanide of ammonium, which dissolved the sulphocyanide of silver. Unfortunately, the double salt formed was again decomposed on a second washing, and again a trace of sulphocyanide of silver was left in the print. By repeating the process a few times the trace of the sulphocyanide of silver left was reduced to an insignificant quantity, and the print might be regarded as practically safe. We tried, however, a large series of prints with a degree of care which might be regarded as considerably in excess of that which in any ordinary photographic operation could be accorded. The first effect appeared in every way satisfactory. The prints were brilliant, of fine tone, and singularly pure in the whites; but on exposing one half to bright light, and protecting the other, during several months, the exposed portion darkened generally, showing the traces of sulphocyanide of silver which were sensitive to light.

We had feared this result from previous experiment in the test tube, and the practical results in printing verified the suggestion of laboratory experiments. We do not enter into further details here, as the result appeared to us conclusive against the use of sulphocyanide for fixing prints. On the question of purity we have said nothing, as we regard absolute purity as a preliminary imperative

condition in conducting experiments. The risk of impurity is small, inasmuch as its detection would be certain. The chief impurity to be feared is a polysulphide which would blacken or discolour the prints brought into contact with it at once.

GEYMET'S PORTABLE CAMERA.

At the last meeting of the French Photographic Society M. Geymet exhibited a little camera for tourists and amateurs specially constructed for dry plate work. The two portions of which the apparatus consists weigh together one kilogramme, or two pounds, and it is possible to obtain with it pictures eight centimetres square.

M. Geymet claims the construction of the apparatus as novel, and thus describes it:—The camera consists of a box of acacia wood four centimetres thick. It carries a globe lens (No. 1), fitted to a copper cylinder, which serves for focussing, in consequence of the backward and forward motion it imparts to the lens. The back of the camera has copper fittings also to receive the ground glass. The latter, which is fixed firmly, is just ready for focussing as soon as a screw is turned, and when the operation of focussing is complete it is pushed back to give place to the sensitive plate. The screw or button is a tube 1.5 centimetre in diameter, containing a focussing glass.

In the upper part of the camera is a groove in which the dark slide fits. A box of dry plates containing fifteen prepared glasses forms the second part of the equipment, and a mechanical arrangement allows each plate in turn, according to its number, to slip from the box into the dark slide in the camera. After the first pose, when the plate has been taken from the camera and returned to the box, a slight pressure from the outside suffices to place the second plate in position ready to be slipped into the dark slide. An indicator outside leaves no doubt as to the position of the next glass to be exposed.

METHYLIC ALCOHOL IN THE DEVELOPER AS AN ACCELERATOR.

In the course of a discussion at the South London Photographic Society allusion was made to a statement made in one of the journals to the effect that a continental photographer had found the addition of methylic alcohol to the developer enabled him to secure good negatives with very much reduced exposure. The experience of members as stated at the meeting in question afforded no confirmation of the statement, but was rather opposed to the notion that any benefit was derived from the addition in question. We find in a letter by M. Alexandre in our French contemporary, *La Moniteur de la Photographie*, the allegation as to acceleration repeated; but a much more precise statement is given as to the formulæ in which the wood spirit is used.

M. Alexandre states that by the addition he describes, the iron developer acquires great energy, and permits very short exposures.

"Into a flask is put—

Sulphuric acid	...	...	...	6 parts
Water	...	...	...	4 "
Methylated spirit	...	...	...	4 "
Powdered peroxide of manganese	...	...	...	6 "

This compound is distilled over a mild fire. I employ simply a lead pipe, doubled back, and placed upon a garden pot, the tube fitting into the hole at the bottom of the pot through a cork. The garden pot is filled with water to serve as a condenser. The liquid secured contains a large quantity of methyle, and corresponds to the aldehyde series of spirits of wine. Five cubic centimetres of this liquid added to a hundred cubic centimetres of the iron solution will render the latter quite as rapid as a developer made with formic acid.

"Care must be taken to employ pure wood or methylated spirits, and on no account should a material be used such as is often sold by druggists for burning purposes, and which generally contains a certain quantity of turpentine."

HOW TO PLACE THE CAMERA PARALLEL TO THE OBJECT IN COPYING MAPS AND PLANS.

BY M. HUGUENIN.*

THE ground glass and the partition which carries the lens must be in two perfectly parallel planes, which may be tested with a lead-line. The optical axis of the lens—that is to say, the line that passes through the centre of the different glasses composing it—should fall perpendicularly upon the ground glass; the point where this optical axis falls should be marked by a cross pencilled upon the glass. To find the exact spot where this mark should be, the two lenses that are combined are covered with two diaphragms of opaque paper, the centres of which are pierced with a very small opening. Then a brilliantly lighted object is focussed, and you obtain upon the ground glass a luminous circle, the centre of which is the point sought for. Finally, as in drawing out the camera the parallelism between the ground glass and the lens may be deranged, it is well that the lower frame, or rear portion of the camera, should be exactly adjusted between the two sides, so that any deviation that may take place can be rectified. It is unnecessary to add that in making reproductions of all kinds it is necessary to have good rectilinear lenses, and of long focus, as short focus lenses are too apt to distort a good deal.

The camera being properly constructed, it is necessary that the plane surface to be reproduced (geographical maps, plans, engravings, pictures, &c.) should be placed before the camera in such a way as to be perfectly parallel with the lens and the ground glass, and the middle of the surface should be the prolongation of the optical axis above mentioned, so that a straight line from the middle of the ground glass passes through the centre of the lens, and falls perpendicularly upon the point which represents the middle of the picture to be reproduced.

These conditions are very quickly realised by means of the method which I have employed since 1859. A square mirror of about twenty centimetres is taken, and by means of three screws fixed behind the frame it is levelled. The screws are regulated in such a way that in putting the mirror upon a plane, parallelism exists between this plane and the silvered surface; once the mirror is regulated, it serves for all reproductions.

To ascertain the relative positions, the mirror is put against the centre of the subject to be reproduced, and the operator looks at the ground glass. If we suppose the centres in a straight line, and the parallelism exact, the image of the lens will reflect itself in the mirror, and as the rays which form this image fall perpendicularly upon the silvered surface, they are reflected rigorously upon themselves, and give an image of the lens in the middle of the ground glass. If all the centres are upon the line of optical axis, the point marked in pencil upon the ground glass as being the centre will also be the centre of the image of the lens. If, on the contrary, the parallelism is not exact, the rays falling upon the mirror are reflected no longer perpendicularly, but according to an angle more or less considerable; the image of the lens is deviated to the right, or left, or above, or below. Matters are then rectified by varying the position of the mirror, and of course that of the support, until the conditions are realised, viz., to put the image of the lens in the middle of the ground glass where the pencil cross is.

If, from some reason or other, the image of the lens is not visible enough, the frame may be surrounded by a strip of white cardboard, or by placing before and towards the

centre a light of sufficient strength. This flame it is, then, which must be brought into the centre of the ground glass.

One operator alone may easily employ this process by putting himself before the lens, displacing the support of the picture and the mirror until he sees his own image reflected; he then proceeds to focus the image according to the indications upon ground glass.

This method of operating, which appears the most simple, both in theory and practice, has permitted one to secure easily, without any distortion, reproductions of maps of large dimensions.

MAGNETIC PHOTOGRAPHS.

BY W. HORSEMAN KIRKBY.*

THESE photographs show the lines of direction, and the field of magnetic influence between the poles of horseshoe magnets. The negatives were obtained in the following manner:—

In photograph No. 1 four magnets were laid on a table, their poles forming a square, every N. pole having a S. pole for its immediate neighbour. On this was laid a dry plate, face upwards, and fine iron filings dusted on. Under the influence of the magnets, the filings arrange themselves in a definite pattern, and this is facilitated by giving the plate a gentle tap. All these operations were conducted by candlelight. The gas was then turned on for three minutes, and the plate afterwards developed in the usual way, the filings having been first carefully dusted away.

The second photograph was with the poles arranged so that the N. pole of each magnet was next to the N. pole of its neighbour.

The third was a combination of the two preceding figures.

The fourth was with the poles forming a triangle.

The idea of using photography for this purpose struck me when lately witnessing some experiments by Mr. Philip Braham, of Bath, who expressed his regret that he had no handy means of recording the figures he met with in his investigations on magnetism, and I then and there experimented as above, and these are the results.

HOW TO GET CLEAR SKY IN OUT-DOOR NEGATIVES.

BY RANALD DOUGLAS.†

SINCE my early days in photography I have examined photographic journals many times to find something that would throw light on this subject. Most architectural photographs have their skies worked out mechanically. The leading photographic writers strongly urge against this practice; but when cloud effects cannot be obtained, I am of the opinion that a clear blank sky is better than a uniformly dark one, which generally tends to make prints look flat.

This subject has been my special study for a year past. Experience has led me to the following conclusion:—If the sky appears uniformly dark blue to our eyes, or if there is any haze in the atmosphere, it will surely come out dark in the prints. On the other hand, if it is light blue, or if there are white clouds of any kind, it will act strongly on the negative, and the result is a clear, if not perfectly white sky in the photograph. Hence it is advisable not to attempt architecture in hazy days, unless you are going to paint out the sky. Another thing tends to help the getting of clear skies: use as little acid as possible in your silver, and expose while the sun is obscured by a white cloud, which will remove harsh contrasts; and if the negatives lack intensity, they certainly will gather some if you dry them in the sun before fixing. Try it.

* A communication to the Liverpool Amateur Photographic Association.
† *Photographic Times*.

In architectural photography, swing backs (both ways) are indispensable; yet there are still a few who have never used a swing-back camera box. If you are troubled with the building taking pyramidal inclinations when the camera is inclined either upwards or downwards, an adjustment of the vertical swing will at once correct it. The lateral swing will help in getting the distances into focus with the foreground without necessitating the use of a small stop. Especially is this the case when you have to take street scenes, when it is impossible to get those parts near the instrument into focus with those receding with a non-swing-back box.

Correspondence.

DEVONSHIRE SCENERY.

SIR,—When your correspondent "W. A. C. A." asked to be informed "where he could find a good central spot, with good subjects for photographing for two or three weeks, within easy distance of each other, not Devon, I must confess I was not wise enough to recommend him an "area of two hundred square miles" to select his objects of photographic interest from, and to say they were within "easy distance."

I recommended "Westward Ho!" to spend a fortnight so as to be able to do that, Bideford, Clovelly, &c., and a fortnight at Ilfracombe, so as to photograph that place and Lynton. I had no idea of giving "a puff" to any hotel company, nor any special object. The "puffing" must be left to the left to be who feels it his "duty" to do it. If I have invested the most picturesque objects with their local or historical interest, it might be vanity to suppose that it would be more interesting to do so than leave the hard and "bare bones." This might have been done in a "florid style," but it is an unfortunate habit I have acquired through a long connection with the newspaper press; but it is one that Mr. Martineau is not likely to fall into, judging from the first instalment, which he has felt it his "duty" to give us at the eleventh hour, in favour of Ilfracombe. I had indicated in my first letter that I intended to say something of this place and Lynton; but as your correspondent of last week feels that the weighty claim of "duty" calls him to say all that can be said on the subject, and to say it in an "impartial manner," I feel it is not possible for two suns to shine in one hemisphere, therefore I must retire before his superior merits, and hide my diminished head. But should "W. A. C. A." or any others who may follow in his track, find I have over-stated anything, let them come into 48, Mill Street, and "blow me up"—or, what is better still, do it in the News.—I remain, sir, yours respectfully,

THOS. TEDRAKE.

Bideford, June 7th.

P.S. I have sent per post several photographs of some of the interesting objects mentioned in my letters.

[The prints received are admirable photographs of pleasant scenes. We and our readers are much indebted for the vivid descriptions and valuable information, which were not, in our view, open to any charge of partiality or puffery, or they would not have appeared in our columns.—Ed.]

PHOTOGRAPHING HORSES.

DEAR SIR,—Mr. Vernon gives a simple and, I have no doubt, very effective plan of keeping a horse quiet when being photographed. Perhaps some of your readers would like to know the method we adopt at Woolwich to secure tranquility for a few moments when we are operating with the camera upon military subjects.

When we have a gun with six horses or a detachment of mounted men to photograph, it is almost impossible to get the group perfectly steady without recourse to some artifice, for one horse or the other is continually bowing its head,

or champing its bit, or shaking its trappings. Under these circumstances we employ one of two plans, either of which usually succeeds. When the picture has been focussed, the slide is drawn, and an operator stands ready to uncup. A trumpeter is then ordered to blow a loud and prolonged *fanfare*, when the horses at once prick up their ears and remain perfectly steady. The other plan is to let a horseman gallop straight towards the horses, coming at them full speed, and pulling up sharp when at a short distance off. The models watch the approaching cavalier in perfect quietude, arching their necks and putting up their ears in capital style.—Faithfully yours, H. BADEN PRITCHARD.
War Department, Woolwich, 8th June, 1875.

MR. SAWYER'S IMPROVEMENTS IN THE CARBON PROCESS.

SIR,—I did not see, till too late for reply last week, the letter signed "E. H. D." In reply, permit me to point out to that gentleman that if he will do me the honour to read my descriptive paper, he will see that I do not coat single transfer paper with plain gelatine, nor do I use a solution of lac in ammonia at all. For the information of those who care at all about the matter, I may here state that I first coat paper with a solution of gelatine rendered insoluble by means of chrome alum. I subject this to heavy pressure, then coat with a solution of lac dissolved in soda and borax. It is to be hoped that my having patented this application will induce "E. H. D." and many others to publish anything they may hereafter find likely to prove of advantage. As far as I am concerned, he is perfectly welcome to use my patented support, if he chooses to purchase it at the very small price charged for it; but as I see he hails from the "Hub of the Universe," he will in all probability have a much better thing of his own.—
J. R. SAWYER.

THE PROPERTIES OF WET GUNCOTTON.

DEAR SIR,—Permit me to call your attention to a slight error in your account of the recent guncotton explosion at Woolwich, wherein it is stated that moist guncotton cannot be exploded by means of a detonating fuse, and that, "according to the experience of chemists well versed in its properties, wet guncotton can only be exploded when a charge of dry material is in contact with it, and this is fired first of all."

Without doubt, the employment of an initial charge of dry guncotton is both convenient and advantageous as a means of starting the explosion of a larger bulk of the wet material, and is for this purpose commonly resorted to in practice; but the statement that it is absolutely necessary is not correct, or, at any rate, is contradicted by several passages in Professor Abel's "Contributions to the History of Explosive Agents," a paper read before the Royal Society in February, 1874, and published in abstract in the "Proceedings," from which I quote the following:—

"The absorption of three per cent. of water by guncotton (in addition to the two per cent. which it normally contains) rendered its detonation doubtful by the 'detonator' ordinarily used. By considerably increasing the initiative charge of fulminate, damp guncotton could, however, be detonated."

Mr. E. O. Brown having proposed to apply the detonation of dry guncotton itself to the development of the explosive force of the compressed material when in a moist state, a series of comparative experiments were made for the purpose of determining the relative amounts of mercuric fulminate and of air-dried guncotton which it would be necessary to employ in order to induce the explosion of a quality of compressed guncotton containing seventeen per cent. of water; and it was found that about ten grammes of air-dry guncotton would do the work of thirteen grammes of the fulminate.

Hence, from motives of economy, it is deemed advisable to employ a priming charge of the former, which is itself fired by the fulminating mercury, and acts at once on a larger surface of the wet cotton; but, in the face of these facts, and the admission that there is a "remarkable difference in the behaviour of one and the same explosive substance under nearly similar circumstances," as stated by Professor Abel, I cannot concur in the opinion of your correspondent, except when he affirms, "That no other way exists of detonating or exploding wet guncotton, it is, perhaps, too much to say, in the face of the explosion that has recently occurred."—I remain, dear sir, yours very truly,
JOHN SPILLER.
London, June 7th.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual meeting of this Society was held in the Architectural Gallery, Conduit Street, on the evening of Tuesday, the 8th inst., Mr. J. GLAISHER in the chair. The minutes of a former meeting having been read and confirmed,

Mr. G. HOOPER read a paper on "Sulphocyanide for Fixing," which will appear in our next. He placed some examples of the salts on the table, marked "pure" and "impure."

Mr. J. SPILLER, read a brief paper on the same subject, chiefly devoted to a consideration of the economic modes of producing the salts in question. In answer to a question from the President, he said he thought it was a better fixing agent than hyposulphite of soda.

Mr. HUGHES, in answer to an appeal from the Chairman, said he tried sulphocyanide when it was first proposed as a fixing agent a dozen years ago; but without remembering the precise details, he knew they came to the conclusion that no advantage was gained by its use. Referring to the samples exhibited with makers' names attached, and the words "pure" to one and "impure" to another, he protested against the invidiousness of such a course, when the alleged impurity rested on no definite evidence, but a mere *ipse dixit*. He further protested against a paper which was a mere resume of historical matter published years ago, without one particle of personal experience on the subject.

Mr. R. FRISWELL (Hon. Sec.) referred to the non-poisonous character of the sulphocyanides.

Mr. HOOPER, in reply to Mr. Hughes, said his object was not to obtrude his own limited personal experience, but, if possible, to stimulate experimental and scientific members to give attention to an important subject which seemed to be neglected. As for the samples, he had mentioned no names in his paper; and as he regarded meetings as intended to have an educational result, he thought the exhibition of samples would be useful. He suggested that possibly Mr. Hughes' failure might arise from the use of impure samples, or from failing to use two baths.

After some further conversation and a vote of thanks,

The CHAIRMAN announced that the exhibition would be opened by a soiree on the evening of September 28th, and would continue open until the 22nd of November. He then adjourned the proceedings until November.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE last indoor meeting of the session was held in the Hall 5, St. Andrew Square, on the evening of Wednesday, the 2nd inst., the President, Dr. THOMSON in the chair.

The minutes of the last ordinary and out-door meetings were read and approved, and Messrs. William Donaldson and W. M. Bryce were admitted ordinary members.

Mr. TURNBULL read a paper entitled "Notes on a Substitute for Ground Glass as a Focusing Screen; the Use of an Actinometer in Landscape Photography; an Improved Portable Spirit Lamp; and a Useful Glass Clip" (see page 280). He exhibited the lamp and glass clip, and showed practically the application of putty to the glass, and the exceedingly fine surface thereby produced.

Dr. THOMSON said that the glass, as prepared by Mr. Turnbull, was certainly very suitable for the purpose for which it was intended. He had found that a well-made starch paste

also answered admirably, and if protected by a coat of varnish it would last indefinitely. With reference to the observations of Mr. Turnbull regarding the use of an actinometer, he thought that in some cases it might be of use, but there were very many conditions with which it could not be available. In many cases—probably in most cases—the object photographed and the camera were in different positions relative to the light, and the actinometer could then only mislead. If the camera was in the shade and the landscape brilliantly illuminated, or if, as in the case of taking an avenue, the camera was in bright light, while only the most feeble rays were reflected by the trees, it would, he considered, be altogether useless.

Mr. PRINGLE was quite satisfied with the surface produced by the putty, but he had some doubt as to that material being always to be got. He had had some experience in broken focussing glasses, and found that a rub with a tallow candle could generally be got readier than putty.

Dr. NICOL agreed with the President in thinking that the landscape photographer was not likely to derive much benefit from the use of an actinometer. Referring to Mr. Turnbull's suggestion of a standard paper and standard tints, he thought such an arrangement would be of much value. It would doubtless very much facilitate photographic communication if one could say that by any particular process a picture could be obtained with a stop of $\frac{1}{10}$ in two minutes, with light of 75° of actinism. The only thing wanted would then be a standard negative, and then everybody could tell everybody else all about everything connected therewith. He, however, feared that much difficulty would be found in making a paper that would really be always equally sensitive, even if its manufacture were confined to one maker; and much more would it be so if it were to be produced by several makers. During some recent experiments with various sizes for paper, he had found that the age of the size very much influenced the printing qualities, especially in regard to the time required to produce an image. The same observation also applied to albumen, which, when used quite fresh, made a much slower printing paper than when it was allowed to get stale before use. So far as landscape photography was concerned, he did not think there was much necessity for any actinometer, as he thought every photographer of even moderate experience had, whenever he put his head under the focussing cloth, an intuitive feeling, which told him, pretty clearly, exactly what number of seconds or minutes would be required. This, in his own case at least—and he had no doubt others had experienced it also—rarely failed to be correct.

Mr. W. NEILSON said he always listened to Mr. Turnbull with pleasure, as his communications were not only the result of experience, but always thoroughly practical. He quite agreed with Mr. Turnbull when he said that there was yet much to learn regarding actinism, and thought that those who were fond of experimenting, and had time to gratify their desires, should turn their attention to that department of photography. As a small contribution to the general stock, he might say, that he had generally found that longer exposures were required during the prevalence of east wind. He thought an examination of much of the current landscape work of the day would show that the instinct mentioned by Dr. Nicol was not so general as he supposed, as they were too frequently very wretched pictures, and would strongly recommend all who really want good pictures to expose two or three plates on each subject, giving, of course, different lengths of time to each. By this means they would be likely to get one good picture out of three; and one good negative was surely better than a thousand bad ones.

Dr. NICOL, in reply, stated that he was quite sure that the wretched pictures alluded to by Mr. Neilson owed their quality more to faulty development than to improper exposure.

Mr. MATHEWSON said that he had had the actinometer that was on the table for five years, and that the paper was evidently as good as ever. He had not put it to any practical use, however, as he could generally hit on the proper exposure quite easily. A few days ago, however, while photographing the Scott Monument, he had used it, and found the indication to be correct. In this case both camera and object were equally illuminated, but on going to the Grass-market, where the conditions were reversed, it was of no use. This, of course, corroborated what the President had said.

Mr. DOBIE agreed with Mr. Turnbull, that it was awkward

for a photographer to be without silver—in fact, it was awkward for anybody to be without silver—but he really thought that they should take an example of ships of war, yachts, &c., and always carry duplicates of all essential articles and material when they went to the field.

The following questions from "The Box" were then read, but in the somewhat lengthy discussion that followed, nothing transpired that was really new:—"How can paper be sensitised so as to keep for a lengthened period?" and "Why are some samples of paper so difficult to tone?"

The PRESIDENT said that he had no difficulty with paper prepared in the way that he had already published. He could guarantee that it would keep perfectly for at least six months, and, if fumed, it toned quite as readily and satisfactorily as paper freshly prepared.

Mr. TURNBULL found his method—that of floating on a five-grain solution of citric acid after sensitizing—also very satisfactory for at least a month, and he had no difficulty whatever in toning. The prints, however, required to be very well washed before being put into the gold. In fact, he considered it a general rule that the longer a paper was kept the more washing would be required before toning. It was also stated on good authority that paper prepared with stale albumen was much easier toned than that prepared with fresh, and also that tinted paper required more time in the gold solution than white paper.

Dr. NICOL then said that as the members were always anxious to see anything either new or good in the shape of apparatus, he begged leave to exhibit two articles, which he had no doubt would meet with their approval. The first was an Aird's Camera, which had been made for him by Messrs Kemp and Co., and which on examination would be found to be a piece of very beautiful work. The camera was for plates of $7\frac{1}{2}$ by $4\frac{1}{2}$, and contained one dozen. It measured 9 by 9 by 11 inches, and weighed, when fully equipped, nine and a-half pounds. It worked, as they could see, with perfect certainty, and, to him at least, the comfort derived from having everything connected with the exposure of a dozen plates in one package, and that neither heavy nor very bulky, was very great. He might say that since Mr. Aird introduced the camera to the Society he had had several days with it in the field, and found its comfort and convenience greater even than he had anticipated. The camera was examined with much interest, and very highly spoken of by several of the members who had seen it at work. The other piece of apparatus, he said, was "Hare's Patent Automatic Changing Box and Slide," kindly lent by the maker for exhibition. The box, he said, is, in construction, something like the once well-known changing box manufactured by Ottewill, but without any of the disadvantages which that had, and especially without the large projecting cover. The mechanical arrangements by which the mere act of slipping off and on the slide into a groove on the topshuts and opens the slit through which the plate passes is very ingenious, and the whole movement is so simple that it can hardly get out of order. To those who do not object to more than one package, nothing, he said, could be simpler, or, as far as could be seen from the working of the box, more efficient. It was, he said, somewhat curious that they should have for exhibition on the same night two pieces of apparatus intended for the same purpose, but seeking to serve it by such different means, and it was quite as satisfactory as curious that they both did the work so admirably. In fact, the only difficulty which he could see was that of deciding as to which to choose.

The members generally heartily endorsed Dr. Nicol's statements, and spoke very highly of both camera and automatic changing box.

On the motion of Mr. DOBIE, votes of thanks were given to Dr. NICOL and Mr. TURNBULL, and to the PRESIDENT for his unremitting attendance during the session, as well as for the urbanity and ability with which the duties of the office have been discharged.

The next out-door meeting will be held at St. Monance on the 10th inst. Members will leave the Waverley Station at 6.30 a.m.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Wednesday, the 2nd inst., at the Free Library, the Rev. H. J. PALMER, Vice-President, in the chair.

The minutes of the previous meeting were read and passed. Mr. W. M. Longton was elected a member, and Mr. Isaac Knott an honorary member, of the Association.

Two prints of "Brimham Rocks," taken on gelatine pellicle plates by Mr. Willis, of Scarborough, were presented by him for the Society's album.

Mr. PALMER handed round a number of 9x7 and quarter-plate negatives of interiors, all taken on gelatine pellicle plates; also some prints from the same. He (Mr. Palmer) explained that some were taken with Keane's rapid pellicle, with about six minutes' exposure, and some with the new slow gelatine pellicle, with an exposure of about thirty minutes. With the latter pellicle he found that there was great latitude in the exposure; and he handed round three negatives of a group of flowers taken with an exposure of ten, thirty, and forty seconds, all of which were made equally good during development. For interiors he gave from five to thirty minutes' exposure. An interior of a church, he had many times failed to get with wet collodion under an hour and a-half's exposure, he had got in half an hour with the gelatine pellicle, showing how superior these plates were for this class of work. It was necessary, for interiors, to back the plates with red or orange colour, to prevent blurring.

Mr. W. HORSEMAN KIRKBY handed round some prints illustrating a handy method of recording the forms produced by iron filings under magnetic influence. [See page 284.] He (Mr. Kirkby) also showed a number of excellent prints from negatives taken by the collodio-emulsion process.

The SECRETARY, in the absence of Mr. J. A. Forrest, exhibited and explained the working of a new automatic changing-box, invented and manufactured by Mr. George Hare, of London, and kindly lent for exhibition by Mr. Taylor. It was so manifestly an improvement on the old form, which many of the members had formerly been using and had abandoned for double backs, that it was examined with the greatest amount of interest. The revolving sliding top, brass attachment, and spring shutter of the changing-box were great improvements on the old plan, for they perfectly excluded all light, the shutter only opening when the dark slide was fully attached. The dark slide also possessed a great improvement. Before the box is turned up to let the plate run out, a bolt is pulled at the back of the dark slide; this opens the aperture of the slide, and causes the back to spring slightly away from the front, thus leaving plenty of room for the plate to slide into its place, and doing away with the old risk of the plate sticking half way. The back is then pressed forward until the spring catch fastens; this secures the plate in its place and closes the end.

From the remarks and inquiries made it was evident that the changing-box met with the approval of the members, and also of the owner, who had stated that "he used it with ever-increasing pleasure and satisfaction."

It was announced that Mr. Ellerbeck had presented the Association with a book, in which members could state their wants and wishes in respect to exchanging apparatus, &c.

Mr. O. R. GREEN handed round and described a large and interesting collection of photographs which he had collected during a tour in Egypt, &c.

An excursion to Much Wenlock was arranged for Saturday, the 12th inst., and the meeting was shortly afterwards adjourned.

Talk in the Studio.

PHOTOGRAPHY AT THE ROYAL OBSERVATORY.—From a report just issued by the Astronomer-Royal, detailing the year's operations at Greenwich, we glean interesting details of the definite and recognized position photography now occupies as an aid to the study and record of astronomical and meteorological science. Mr. J. Glaisher, F.R.S., President of the Photographic Society, retired, it is stated, from his active duties at the Observatory at the end of last year.

NONPAREIL PLATES.—In a recent article on these plates a clerical error occurred. We referred to the agent as Mr. Atkinson, of Manchester. It should, of course, have been, of Manchester Street, Liverpool. Mr. Atkinson's name is, however, so well-known that our readers would not be misled by the error.

A COSMOPOLITE ROGUES' GALLERY.—The "London

Lounger," in the *South London Press*, has the following:—"International prison photography is the latest notion. It is not a bad one. An accomplished swindler lately disappeared from Paris, bearing away some costly jewellery which he had obtained from a too confiding dealer. The robber was quite unknown to the Paris police, who never got on his scent, but it appears that their professional brethren in London might have given them a friendly warning. Both the man and his confederate figure in the rogues' album in possession of the Scotland Yard authorities, and it would really seem that an interchange of cartes amongst the heads of police in the leading capitals of Europe would be of service in aiding in the detection of criminals. This particular thief had relations with the jeweller extending over several days, during which his visits to and fro were frequent, and had some Paris detectives previously scanned his photograph they might have been able to lay their hands on the man when he was 'wanted.' It is noticeable that the number of 'high-class' swindlers is exceedingly limited, and that by the very necessities of their craft they must always be on the move. Sooner or later they fall under the clutches of the law, and punishment might overtake them sooner rather than later by making photography an instrument in their detection."

FILTERING.—A correspondent of the *English Mechanic* says:—"For filtering large quantities of solutions, especially when they run through slowly, or one has not a large funnel, I have found nothing better than the india-rubber capsules with two tubes attached. These can be procured of any size to suit the bottle-necks. It is only necessary to cut one tube a little shorter than the other, and when the bottle is inverted over any sized funnel by adjusting the dip of the tubes there will be no danger of overflowing. There is also the advantage of a considerable agitation of the contents of funnel as the air enters the short leg, as the level varies."

WASHING PRINTS.—Another correspondent of the same journal says:—"Having constantly large numbers of photo-prints to wash after fixing, I came to the conclusion, as many before me have done, that the length of immersion is of little avail in removing the hypo, and that frequent changing of the water is everything. I had seen water-wheels agitating boxes, in which the prints were contained, and I was certainly very much surprised that their inventors did not use the tipping-bucket at once, instead of, as in one instance, making the water-wheel rock the tipping-bucket. My present arrangement consists of a deal box, two feet long by one foot wide, divided in centre by a vertical partition. The tap of water supply is over the centre, and the bucket has a fall each side of about three inches. The sides of box are low, and siphons, three in number, empty the depressed sides alternately."

THE DUCHESS AND PHOTOGRAPHER.—It is rumoured that the Duchess Sophie—sister of Duke Charles, a brother of the Empress of Austria, who has taken to studying surgery, with a view to making himself an expert oculist—not long ago married to the Duke of Alençon, one of the Orleans princes of France, has taken such a fancy for practical photography that she has actually eloped with a Bavarian photographer, and is on her way with him to this country. If this story should prove to be true, how humiliated will all our own photographers be! For what young lady, even of the Fifth Avenue, has yet so much as offered to elope with one of the craft!—*New York World*.

LOYALTY PROMOTED BY PHOTOGRAPHY.—"Some well-meaning people," says *Funny Folks*, "years ago predicted that photography would be fatal to loyalty. They believed that the country regarded the Queen as a sort of Grand Lama, and the Royal Family as so many sacred abstractions, and that the inevitable effect of familiarity would be contempt. It has proved quite the reverse. With every second shop-window full of portraits of her Majesty, the Prince of Wales, and every member of the vast family down to the infants of the remotest branches, with a place for the Royal portraits in every portrait album in every house, the sentiment of national regard is strengthened rather than the reverse. A closer attachment seems to have sprung up from the true presentation of the Royal lineaments than could ever have been brought about by the ideal portraiture on the coins. The Queen and those about her seem to belong more to ourselves—heads only of the great national family."

A GLUE which will resist the action of water is made by boiling one pound of glue in two quarts of skimmed milk.

MEPEMPOLOGICAL REPORT FOR MAY.

BY WILLIAM HENRY WATSON.

Observations taken at Bangsdown, near Whitehaven,
30 feet above sea level.

Date.	Temperature.			Direction of Wind at 5 a.m.	Remarks.
	Morning.	Noon.	Evening.		
1 2 3 4 5 6 7 8 9 10 11 12	50 53 55 58 58 58 58 58 58 58 58 58	50 53 55 58 58 58 58 58 58 58 58 58	50 53 55 58 58 58 58 58 58 58 58 58		A little rain this morning and at night.
13 14 15 16 17 18 19 20 21 22 23 24	50 53 55 58 58 58 58 58 58 58 58 58	50 53 55 58 58 58 58 58 58 58 58 58	50 53 55 58 58 58 58 58 58 58 58 58		Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy.
25 26 27 28 29 30 31	50 53 55 58 58 58 58	50 53 55 58 58 58 58	50 53 55 58 58 58 58		Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy. Partly cloudy.

Summ.	Mean.	Max.	Min.
50	53	58	45

The Photographic News, June 18, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. LIGHT AS A MOTIVE FORCE—THE RETIREMENT OF MR. GLAISHER FROM THE GREENWICH OBSERVATORY.

Light as a Motive Force.—The striking discovery of Mr. William Crookes, F.R.S., whose name is well-known to photographers as a former secretary of the Photographic Society, and as an early experimenter in photographic sciences, has been one of the principal attractions at the recent soirees of the Royal Society, and may be considered the latest novelty in the scientific world. As a contemporary recently remarked, Mr. Crookes has made use of light as a source of motion, and has succeeded in making machinery turn by the mere action of light rays. No doubt we shall have plenty of people to tell us there is no novelty in the circumstance of light being a source of motion, for the action of rays upon certain salts used in photography, for instance, brings about a change in weight, no doubt with the change of colour and other properties, and would thus set in motion any balance, fine enough, in which such salts were placed and exposed to light. Then, the case of flower and plants that grow and incline towards the light might be mentioned, and many other similar instances. But Mr. Crookes' discovery is something far beyond all these. He can make a little cross-bar poised on a pivot swing round on approaching to it a source of light. There are little discs, or pith balls, at the extremities of the cross-bar, which is sealed up in as perfect a vacuum as can be readily produced, and the light rays, acting upon the discs or balls one after another, set the little apparatus spinning. To get a better idea, however, of Mr. Crookes' experimental investigation of "Attraction and Repulsion accompanying Radiation," we must go back to his lecture on the subject at the Physical Society. To exhibit first of all the phenomena of attraction in air, and repulsion in a vacuum, he used a glass bulb in which was suspended from a silken thread a fibre of glass with a pith ball at either end. When this apparatus was full of air at ordinary pressure a ray of heat or light falling on one of the pith balls gave a movement indicating attraction. When the glass bulb was exhausted by an air-pump, then strong repulsion was shown when radiation was allowed to fall upon one end of the index. Ice, or a cold substance, produced the opposite effects to heat, the pith ball being energetically repelled by a warm hand, and as strongly attracted by a piece of ice. Going a step farther, Mr. Crookes then showed that the results he obtained were not confined to heat or the heating rays of the spectrum, but that any ray from the ultra-red to the ultra-violet produced a movement of the index in a vacuum. His apparatus, which swung 90° with a touch of the finger against the bulb, moved even under the influence of a ray of moonlight. Mr. Crookes then tried interposing screens between the ultra-violet rays of the spectrum and the pith balls, and he found that if he placed between them a cell containing a solution of iodine in disulphide of carbon, which is opaque to the luminous and ultra-violet rays, but transparent to the invisible heat rays, there was not a trace of repulsion to be observed; while when he interposed a thick screen of alum between the ultra-violet rays and the pith ball, the latter acted with unabated energy, although alum, it is well known, cuts off all the dark heat rays. When the ultra-red heat rays of the spectrum were allowed to fall on the pith ball, whether there was a screen of iodine solution or not, there was an energetic movement of repulsion. When the alum and iodine screens were united, then there was no action upon the pith ball either of attraction or repulsion, no matter what ray was allowed to fall upon the apparatus. Mr. Crookes argues that the motion of the index cannot be ascribed to any currents of residual gas which theoretically must exist in vacua, even when almost absolute;

neither does he believe the movements to be due to electricity developed on the moving body, or on the glass apparatus, by radiation; nor to the results of evaporation and condensation, as suggested by Professor Osborne Reynolds. We will give Mr. Crookes' explanation of the matter in his own words:—"My own impression is that the repulsion accompanying radiation is directly due to the impact of the waves upon the surface of the moving mass, and not secondarily through the intervention of air-currents, electricity, or evaporation and condensation. Whether the etherial waves actually strike the substance moved, or whether at that mysterious boundary-surface separating solid from gaseous matter there are intermediary layers of condensed gas which, taking up the blow, pass it on to the layer beneath, are problems the solution of which must be left to further research."

The Retirement of Mr. Glaisher from the Greenwich Observatory.—It is with much regret that we learn that Mr. Glaisher, F.R.S., the President of the Photographic Society, has resigned his appointment at the Royal Observatory at Greenwich. After being upwards of forty years in that establishment, connected for the most part with the Meteorological Branch, of which he was director, the information and experience he possessed must have been very great; and it will be very difficult, if not altogether impossible, for the Astronomer-Royal to secure another officer so fit and able as Mr. Glaisher for the responsible post he has vacated. Although it is, we believe, the privilege of all officers in Government employ to retire on a pension after a certain number of years' service, and while we fully admit that Mr. Glaisher has well earned his retirement, we cannot but regret that some effort was not made on the part of the Admiralty to retain the services of their director of the Meteorological Department, even if it were but as a consulting officer, for some years longer. We are well aware that Mr. Glaisher has been longer in the service than is the case with most Government servants, but scientific men whose value consists mainly in their knowledge and experience are very different to those who are required to perform constant active duties. The mere fact that Sir George Airey still continues at his post at the Observatory, rendering, at his advanced age, more valuable services than he did as a younger man, amply proves how men of science are frequently at their best when other men have retired from the more active duties of life. For this reason we cannot help thinking that the country has lost far too soon the valuable services of an experienced officer; and it is much to be regretted that some inducement was not held out in order, if possible, to retain Mr. Glaisher's assistance awhile longer. It is not often that dash and courage are required by scientific men in conducting their quiet investigations; but Mr. Glaisher's half hundred balloon ascents, in one of which he ascended to a height of seven miles—the greatest altitude to which any human being has ever attained—when he obtained a view of the whole breadth of England, from Lowestoft to the Welsh coast, tells us that the worthy President of the Photographic Society would have succeeded quite as well in other walks of life as he has done in the world of science.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER VII.—continued.

THE FIXING SOLUTIONS.

FOR fixing negatives either cyanide of potassium or hyposulphite of soda may be used; but for several reasons the latter is to be preferred. Cyanide of potassium is highly poisonous, and, entering the system either through wounds on the hands and the pores of the skin, or its fumes being inhaled, its effect on some constitutions is indeed terrible. When used as a fixing agent, dissolve one ounce of cyanide

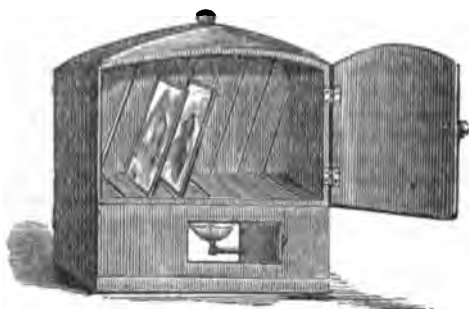
of potassium in six of water, and it may be used until its strength is exhausted.

Make a saturated solution of hyposulphite of soda. A flat dish or tray in which two or four negatives can lie side by side is to be preferred to the dipping bath sometimes used, as you can leave them in the solution for a long time without hurt. This solution should be constantly changed—that is, every day, or two, or three days, according to the amount of work done—as it after a time becomes saturated with iodide of silver, and deposits crystals of iodide on the negative, causing pinholes precisely similar to those caused by the bath when overcharged with iodide. The old fixing solutions may be preserved for reduction in a barrel, and the silver is thrown down as sulphide of silver with sulphuret of potassium.

VARNISHING THE NEGATIVE.

After fixing the negative, it is thoroughly washed and dried, and is now ready for varnishing. Here too much care cannot be exercised, as many negatives are ruined in this operation by carelessness.

A good varnish will dry, giving a surface perfectly smooth and hard, and will not present a "dead" appearance. The negative, before varnishing, should be warmed to a gentle heat, and for this purpose a little tin oven is used,



fitted with grooves at an angle of 30° , in which the plates can stand safely side by side about an inch apart. Under a false floor a gas jet may be inserted to keep the stove at a uniform and gentle heat. When the negative has been perfectly dried, and is warm—not hot—to the touch, flow it with the varnish as the plate was flowed with collodion, allowing the varnish to soak into the film for a few moments before the residue is poured back into the bottle. This should not be the pouring bottle, but one kept handy with a filter, in which the surplus varnish is caught. This surplus is thus filtered at once, and when full the bottle may be used as the pouring bottle, while the other holds the filter. In this way dust and dirt are not carried back into the bottle from which you pour the varnish. Rock the plate gently after the surplus varnish is flowed off, to prevent the film setting in ridges. Now return the plate to the oven, and when dry the varnish should present a smooth, hard, and glossy surface.

Should the varnished surface present a dead appearance when dry, it shows that the plate was not sufficiently warmed before applying the varnish, or that it was chilled during the operation. In this case it should be heated to the proper temperature, and revarnished more carefully. If through inadvertence the negative has been varnished before it is perfectly dried, a stain will mark the presence of the dampness of the film under the varnish, a second varnishing, first subjecting the plate to heat, may remedy it, but great care should be exercised to guard against dampness and dust spoiling the negative at this stage, for failure is easy, and an accident is almost irremediable except by the exercise of great skill, and certainly at the expense of much wasted time.

An alcohol varnish film may be removed by pouring alcohol on and off the surface. Take in a glass a small quantity of alcohol, and evenly flow the film (this will

moisten the varnish); then continue to pour alcohol on and off, catching it, as it runs off, in the pouring glass; the film will dissolve and run off with the alcohol; but this should not be resorted to except in extreme cases, as the negative is liable to become stained.

Much of the beauty of the negative, and more of its usefulness as a printing cliché, depends on the varnishing. I have abstained from giving the reader a formula for varnish, as I am of opinion that from the difficulties to be encountered in its manufacture, he had better purchase one of the many good commercial samples.

When by evaporation of the alcohol it becomes too thick, the addition of alcohol will be needed.

A varnish showing tendency to dissolve the collodion film evidences the presence of ether in its composition, and should at once be cast aside.

[By inadvertence the foregoing chapter has appeared before that on development, which will follow.]

THE PRACTICAL PRINTER IN AMERICA.

XXVIII.

SALTING THE PAPER.

To be sure to have a good quality of paper for sensitising, we almost invariably salt it ourselves; and as it is not at all difficult to do, we should advise our readers to do it.

When the printers wish to salt their own paper the following formula will be found to be excellent:

Pure rain water	...	...	60 ounces
Chloride of ammonium	...	...	360 grains
Gelatine	...	...	120 "

We add the gelatine to the solution, as it gives a much better surface for the ink-worker to work on. Mix in a large wide-mouth bottle, in which the sixty ounces of water are first placed. This water may be used quite warm if the printer is in a hurry, as the chloride will be dissolved more readily. The gelatine to be dissolved is placed in a small evaporating-dish, and a small quantity of water (about four ounces) is taken from the sixty ounces in the bottle, and added to it. The dish is placed on a hot stove, and the water is heated to a boiling state. When this gelatine is dissolved, add the liquid to the bottle containing the dissolved chloride, and stir very thoroughly, either with a clean glass rod, or by repeated shakings of the bottle. Filter the solution, when it has cooled, through a couple of thicknesses of good filtering-paper into another wide-mouth bottle. Always keep the bottle covered with a clean glass when not in use, whether it has the solution in it or not. This solution should always be filtered again immediately after use. When ready to salt the paper we obtain a suitable size dish—a half-size porcelain dish will do—and thoroughly clean and rinse it. Pour the solution in the dish, and if there are any bubbles formed in doing so, break them. The paper can either be floated upon or drawn through the solution. If floated, examine the paper thoroughly, and float the side that has the finest grain. As the dish is a half-size one, the paper will have to be floated in half sheets; but when floating is adopted, a whole-size dish had best be used. Float ten seconds.

If you prefer to draw the paper through, which is the way most generally recommended, and followed out, then place the dish containing the solution in the middle of the room firmly set upon a stool, and where there will be plenty of elbow room. Take the paper by the two opposite corners, place it behind the further side of the dish, and permit it to hang suspended there. Now draw the paper slowly over the side of the dish, curving and diving the side which you have hold of beneath the surface of the solution. Do not pause, but continue drawing the paper over the side of the dish and under the surface, being careful that you wet all parts of it, and then hold the sheet over the dish by the same corners which were taken hold of in the first place, and allow the solution to drain from the sheet into the dish.

The most important part of this simple process is to get the paper under the solution at first in drawing it through, and to do this we have recommended the use of sixty ounces of solution in the dish (a hundred would be better still), as the paper can be drawn under better than it could with a less quantity. When drained the paper should be hung up by the two corners in a warm room to dry. Do not hang up plain, salted, and sensitized paper to dry, by the same pins.

The air should be absolutely free from all dust in the drying-room while the paper is drying. This solution can be used repeatedly; the bubbles should be removed from the solution every time they appear. These bubbles are caused principally by the dripping of the solution into the dish, when the sheet of freshly salted paper is suspended over it. The forming of these bubbles can, in a great measure, be avoided if the sheet had its lower corner in the dish and besides draining as well as before, there will not be any drops that will fall any distance from the sheet, so as to occasion the bubbles.

If, after salting, and while the paper is draining, there should be seen any bubbles on the paper, blow at them, and break them as soon as possible. After you are through using the solution, pour it back in a bottle, and filter it into its former receptacle. Clean thoroughly the dish, and set it away, bottom side up, on some clean paper. Such is our mode of salting, which we always find productive of excellent results.

POSITIVE BATHS FOR PLAIN SALTED PAPER.

The paper when salted and dried is ready to be sensitized. A different bath is most generally used for the plain paper, as will be explained further on. A plain bath of nitrate of silver, forty grains strong to the ounce of water, can be used; such a bath being very strongly recommended by many of our first-class photographers as the very best for plain paper use. It is most assuredly excellent. For plain paper a plain nitrate of silver bath—thirty grains of nitrate silver, water one ounce—is the best.

Then, again, the ammonio-nitrate bath is very often used. It is made as follows: Make up sixty ounces of solution of nitrate of silver so that it will be forty grains strong of the silver to the ounce of water. Take two-thirds of this solution (forty ounces), and add aqua ammonia to it until it has become clear after it has once become muddy. While adding this ammonia, add a few drops of it at a time, stirring well after each addition. Now add the remaining one-third to the two-thirds, stir well, and filter before use.

When the paper does not foul the solution the albumen silver-bath is used by a very great many photographers, and it is floated upon it in the same way as the albumen paper. Although it does not seem to hurt the bath for albumen paper in some cases, yet the plain paper undoubtedly discolours the bath quicker and deeper, and is likely in time to get many impurities in it that will after awhile hurt the albumen paper. For this reason we have always been in favour of a different solution for the plain paper, and always use such, whether we float or swab our paper, as then, if we should prefer at any time to float our paper we can do so. We should advise the beginner to use a different bath for the plain paper until he had experience enough to observe the effects of floating plain paper on the albumen paper bath. The care of this bath is the same as it is in the case of the albumen paper bath.

URANIUM AND ITS USES.

BY J. WERGE.*

URANIUM was unknown to the ancients. The Phœnicians, in some of their visits to Cornwall for tin, might have picked up the ore or source, but they did not know it, nor what it contained. For a long time the mineral or com-

pound mass was supposed to be a zinc ore, and was named "pichblende;" but in 1789 Klaproth discovered that pichblende contained uranium. The metal was named after the planet discovered by Herschel in the same year. There is very little uranium in the earth. Perhaps there is more in Uranus, but that country is afar off, and we are not likely to know. However, the little we have has been found useful in the arts.

There are various salts of uranium, but nitrate and persulphate are the most common. The latter is employed chiefly by glass makers, potters, and enamellers for making yellow stains.

The nitrate of uranium is of most use in photography, and is obtained by crushing the ore pichblende, heating it in a muffle, and digesting it in nitric acid, diluted with four parts of water. The nitric solution is filtered, and sulphurated hydrogen passed through it to throw down other metals. The clear solution is poured off, boiled, filtered, evaporated, and crystals of nitrate of uranium are deposited. All photographers may not be so well acquainted with uranium as they are with silver. Here are samples, labelled. Enough for uranium. Now for its uses.

Theory and practice are sometimes widely at variance; but my practice has invariably confirmed my theory respecting the use and value of nitrate of uranium when employed in photography. My earliest experiments with uranium convinced me that it was in no form so useful or so sensitive to light as the salts of silver, therefore I adhered to the theoretical conviction that it would be useless to add nitrate of uranium to the nitrate of silver bath, to obtain increased sensitiveness; for, speaking figuratively, I thought it folly to expect the pace to be quickened by yoking a slow horse to a fast team. That the uranium salts are less sensitive to light than the silver salts is known to most photographers; but, if any evidence on that point be needed, I think that the two examples I now place before you will supply it. No. 1 is salted paper, floated on a sixty-grain solution of nitrate of silver for three minutes. No. 2 is plain paper floated on a sixty-grain solution of nitrate of uranium for three minutes. Both were exposed under the same negative, for the same length of time. They are the two halves of a stereoscopic negative. Mark the difference! Light alone reduced No. 1 to what you see it; while the undeveloped half of No. 2 has not the slightest trace of any image upon it, and even the *developed* half is much more feeble than the silver print. As far as uranium is concerned, it makes very little difference whether plain or salted paper is employed. No. 3 is a uranium print on salted paper. The paper was immersed in the uranium bath, otherwise the print was treated the same as the developed half of No. 2.

Much may be done, photographically, with uranium, and I have for a long time past experimented with it, and endeavoured to utilise it in my business. I have met with both disappointments and surprises. The general experience with uranium printing is a latent image, or, at the most, a faintly visible one, which must be developed with a solution of ferridcyanide of potassium; but I have succeeded in obtaining a tolerably vigorous visible image—quite as good as a weak silver print on plain paper—without development. No. 4 is an example of the visible image. The grey half is just as it came from the printing-frame. The red half was developed with ferridcyanide and washed. No. 5 is a better and unsophisticated example of the non-latent form of a uranium print. On account of the uranium image being much more in the paper than on it, I have made many experiments, with the hope of producing a brighter picture. Nos. 6 and 7 will illustrate the results. I have obtained uranium positive prints on plain, salted, albumenised, and gelatinised papers, examples of which I place before you; and, in consequence of the general colour being red, and the picture more in the paper than on it, I thought that good paper negatives could be obtained with uranium. Here are examples. I thought the uranium

* Read before the South London Photographic Society.

negatives would be better than silver negatives on paper; but that is not the case, as this silver negative from the same transparency will show.

I have worked with uranium in water, alcohol, ether, size, starch, albumen, and collodion, and obtained pictures on paper, glass, wood, and ivory; but my greatest success has been on canvas. This example was produced with a collodion emulsion of uranium. The exposure was very short—only while I held it in my hand in sunshine. The developer was ferridcyanide of potassium. For some time I almost despaired of producing a collodion uranium picture on canvas, it was so difficult to prevent the prepared ground from working up with the emulsion; but by previously coating the ground with starch, I overcame the difficulty.

I think I have exhausted the list of the photographic usefulness of uranium, and will now endeavour to point out its uselessness.

It is useless to add uranium to the printing bath with the hope of obtaining any beneficial results, and I think that fact has been sufficiently proved by the unenviable soubriquet of "worthless type" having been bestowed on the Wothlytype process. It is useless to add uranium to collodion, for neither delicacy, density, nor rapidity is obtained thereby. This negative exhibits a deficiency in all these desirable qualities. One-half of the plate was coated with ordinary bromo-iodised collodion, and the other half with a portion of the same collodion, with six grains of nitrate of uranium added to one ounce. The plate was sensitized in the usual working bath, exposed in a twin-lens camera for ten seconds, and developed with iron.

It is worse than useless to add nitrate of uranium to the negative bath, as all the examples I now lay before you will show. I have tested the urano-nitrate bath against the ordinary silver bath in all conceivable ways, and tried it in all proportions, from two to fifteen grains to the ounce; I have worked with various collodions, and have rung all the changes of mixing; I have added nitrate of uranium to old baths and new baths, to plain solutions of nitrate of silver, to iodised solutions, and to solutions containing nitrate of barytes; I have tried it in the developer without being able to arrive at any other conclusion than that the addition of nitrate of uranium to the negative bath, or any of the solutions employed in the wet process, is a delusion and a snare.

ON A NOVEL SYSTEM OF MASKING, AND THE PRODUCTION OF BRILLIANT PRINTS FROM WEAK NEGATIVES.

BY W. BROOKS.*

I WISH this evening to bring before your notice a novel system of masking negatives for printing for the purpose of producing brilliant and vigorous prints from weak and indifferent negatives, and I do not put it forward as anything new, although I have not seen anything published relating to it. In my own practice I have found it of great value on many occasions through being able to increase or decrease the intensity or printing power of any negative at pleasure without altering or endangering it in any way whatever.

In the first place, we will suppose we have a negative that has been varnished, and on printing we find it so thin that it is impossible to get a presentable print from it, either by printing in the shade or by using highly-salted paper and a strong exciting bath. With the most skilled operator a negative will sometimes turn out in this way, and in some instances it is not possible to get another negative of the same. Now, if we carefully study the negative, we will find generally that the contrasts are not great enough, which causes it to print flat. There are many ways of giving more intensity to varnished negatives, but

I consider it is always attended with great risk, and it is a dirty affair at the best of times.

The system I adopt is this:—I print a proof in the usual way on either Saxe or Rive paper. I prefer the former, and print a little darker than usual. The paper should not be salted with less than twelve grains of chloride of ammonium excited on a sixty grain bath, although an eighty-grain bath is preferable. It should not be printed to obscure the high lights. Tone *slightly* with gold in the usual way. I know some will say that toning is not requisite, but I find that I get a little more density by it if not carried too far; if it be carried on to the black tones it loses its non-actinic power and colour, whereas slight toning seems to increase it. From this paper print, after being spotted out in the usual way (waxing is not needed), print a paper negative in the printing-frame. I must here mention that if the original negative in the first instance be a very thin one, the paper positive, before being used for printing the paper negative or mask, may have the shadows strengthened with indian-ink. If only a slight intensity be required, this strengthening can be dispensed with, and the depth of printing the paper mask is regulated accordingly. I also like to tone slightly. When dry lay the original glass negative over this paper negative mask so that everything coincides as nearly as possible, and trim in the usual way. If trimmed at this stage it saves trouble. Wet it to cause it to expand, and just press it between blotting-paper to take up superfluous moisture. Run a margin of thin glue of about a quarter of an inch round the edge of the paper, and then place the bare glass side of the negative on it, taking care to keep an exact margin all round the glass. When dry it will be strained perfectly flat like a sheet of drawing-paper on a board.

On looking through the negative from the varnished side one will be surprised to see how the negative has improved in quality and in general appearance. Before doing anything more to the negative it is best to print a proof. In some instances it will be found to give all that is needed; but sometimes the negative is now too intense, which can be easily altered. Lay it, varnished side down, on a table, and give the paper negative backing a coat of castor oil dissolved in twice its bulk of ordinary methylated spirits with a flat brush, which will render it more transparent. I consider the oil and spirit better than white wax when it has not come in contact with the silvered paper for printing the proofs. On printing another proof, if this be found to give too hard a print, it will be best to print another paper negative mask not quite so deep. This system may be applied to a negative which has been over-exposed and fogged, and will not give a decent print in the ordinary way.

Another point I think worthy of attention—it seems to do away with a vast amount of the so-called retouching. These retouched prints put one in mind of the French and German lithographic prints we see in the shop windows, which seem to have nothing natural about them. The only legitimate use of retouching is to supply that in which photography falls short—such as freckles. I find this system of masking seems to meet these shortcomings to a great extent.

Another point I also consider worthy of note, especially in landscapes: sometimes the foreground prints black and heavy, and, at the same time, the negative possesses abundance of detail, although not strong enough to print. Print a proof and paper negative, and mask, as in the first instance. If it be the foreground that requires the strength, lay the paper mask down on a sheet of glass, albumenised side up; take a brush charged with a strong solution of cyanide of potassium, and go over all the parts except the foreground, which must be left untouched. All those parts will be eaten away, and leave the paper quite white; it must then be well washed, and attached to the glass negative as before described. If the sky does not print white enough, or if it be stained, I take the

* Read before the South London Photographic Society.

paper positive, before printing the negative from it, and treat it in the same way with the cyanide, which will cause the negative mask to print very dense, so as to completely mask the sky. I believe this to be a very efficient and neat system of mapping out a sky when required.

We now come to a negative that is very hard, but possessing abundance of detail. By using a positive print instead of a negative mask matters will be found to improve. I think Mr. S. Fry, some years since, spoke of a method of using a glass positive for this purpose to give a softer print. If the negative be a valuable one, it is best, after the masking is correct, to fasten a sheet of glass over the mask to protect it from dirt and injury.

In these remarks I do not recommend photographers to take negatives at random, regardless of intensity, thinking they can mask it up to supply the shortcomings of slovenly manipulation.

A NEW METHOD OF EMULSION WORK.

BY CAREY LEA.*

In my last communication to the Society, made a month ago, I described a method which gave plates of extraordinary sensitiveness, arising from the introduction of an iodide into the emulsion. Since then, aiding myself with this principle, I have been endeavouring to work out a method of operating which should reduce the labour of dry plate work to a minimum, whilst affording the best possible results. My special object was to find means of making an emulsion which should require nothing more than to be poured out on a glass plate, and which as soon as dry should be ready for exposure, requiring no bath or after treatment whatever, and no backing or staining of the film, and which, nevertheless, should possess a high degree of sensitiveness. This result I have succeeded in obtaining, and it is the purpose of the present paper to give such explanations as will enable any one to prepare these plates.

A year or more ago, Mr. Bolton devised a very ingenious new mode of managing emulsions. He poured them out, allowed them to dry, then with water washed out all the soluble salts, dried the pellicle, and dissolving it with alcohol and ether made a new emulsion, which needed only to be poured out on glass plates, and, after backing, was ready for use. With all its ingenuity, this system had the fatal fault of affording plates deficient in sensitiveness and needing long exposures. From my own trial, I should say that these plates needed as many minutes of exposure as those which I am about to describe need of seconds. Moreover these plates required to be backed to prevent blurring, and of course to be washed off again before developing.

One reason for this want of sensitiveness lay in the fact that Mr. Bolton did not succeed in applying to his plate the principle of using an excess of silver nitrate with a chloride and aqua regia. He reported that the result of such treatment was failure, and that the operator must be content with the degree of action resulting from the use of bromides only, with an excess of alkaline bromide.†

By using an iodide in the collodion as well as a chloride, and aqua regia with an excess of silver nitrate, I obtained a considerable degree of sensitiveness, but still not sufficient. With farther experiment, I discovered a new principle of treatment, which at once solved the difficulty, and laid the

foundation of a process combining the highest degree of sensitiveness and the utmost facility of execution. This new principle consists in applying at once to the whole mass of collodion the same preservative (or rather accelerator, as it should more properly be called), the same treatment that is usually applied to each plate in detail; that is, instead of applying an albumen, gallic, tannin, gum, &c., preservative to each separate plate, it can be applied to a pound or a hundred pounds of collodion at once, and then be washed out again. Of course the saving of labour is something prodigious, and the result is a uniformity of plates, a certainty and regularity of action, which is perhaps an equally great gain with the saving of labour; and using this method in connection with the emulsion process, which I described, one obtains plates of the same exceptional sensitiveness, and with greatly less labour.

Let us for a moment compare the amount of work involved in this process with that required for making a dry plate with a negative bath.

In the latter method, the plate must be coated; and then plunged into a nitrate bath. After remaining for some time in this, it is taken out, carefully washed in several waters, and then placed in a preservative solution, where it must remain nearly ten minutes. If a batch of plates is being prepared they get much in each other's way, and to go on regularly, one needs two or three baths; I generally used three, finding it less trouble than to wait; or if one pours the preservative over the plate, this takes some considerable time, and without care and dexterity the action is not uniform, and there results the irregularity of action which has done so much to render dry plates unpopular.

Next the plate is to be dried. The watery, and often sticky, solutions with which the plate is covered, make its drying slow. Small plates may be dried by heat, but larger ones are apt to dry irregularly. So a drying box is needed, and much trouble with it. Then there is the backing; and after exposure there is the backing to be washed off; this I have always considered the most disagreeable part of the whole work, and a single drop that gets round the edge ruins the plate.

In the way which I here describe, the plate is coated, and then is done. No washing, no bath of preservative, no drying box, no backing, no washing off. The films, being only moist with alcohol and ether, dry rapidly. Ten or fifteen minutes dries them, or, to make sure, they may be let to stand half an hour in a rack, and can then be transferred to the slides or plate box. The iodide of silver, which by my new mode of working is introduced into the film, makes it opaque and yellowish, and prevents both internal reflections and irradiation, the causes of blurring. And so the troublesome and vexatious operation of backing is got rid of.

The cost of obtaining this extreme simplicity is that of taking a very moderate amount of trouble with the emulsion once for all. As these emulsions will soon doubtless be manufactured commercially, even this trouble will be spared the dry-plate worker. In travelling, for example, what a simplification to carry a bottle of emulsion, and prepare plates in an hour in the evening, enough to last for perhaps a week's work! As everything soluble is washed out of the emulsion, there appears every reason to expect that these plates and the emulsion itself will keep indefinitely. Moreover, the dried material may be sealed up in bottles, and probably will keep good for years, ready at any time to be placed in alcohol and ether for use.

In preparing the emulsion, I recommend a very close adherence to the following directions. They have been arrived at by very long and laborious work, and a departure from them, seemingly very unimportant, may have the effect of producing plates requiring a fivefold or tenfold exposure.

As the emulsion is to be dried, it may be prepared a little stronger than eventually needed. I usually make it so that three ounces of the first emulsion make four of the final.

(To be continued.)

* Read at the April meeting of the Photographic Society of Philadelphia.

† Mr. Bolton says: "I have never been able to obtain any satisfactory result with emulsions which contain no soluble bromide."—*British Journal*, 1874, p. 169.

And again, in the "*British Journal Almanac*" for 1875, p. 55: "A very fair degree of sensitiveness may be obtained by allowing the silver to be in excess during a portion only of the time during which the emulsion is sensitising; but let there be invariably an excess of bromide before pouring out. Disregard on this point will entail a host of troubles."

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DRY PLATES WITHOUT GLASS.

A COMMUNICATION made to the last meeting of the South London Photographic Society bids fair to revolutionize landscape photography. Herr Leon Warnerke, an Austrian gentleman resident in this country, an experienced photographer and enthusiastic experimentalist, has worked out a method, novel in almost all its details, and combining many of the advantages of which landscape photographers have often dreamed, but which until now have never had even promise of realization. His invention involves the possibility of proceeding on a photographic tour with the material for (say) a thousand negatives, without more increase in the bulk or weight of his equipment than is now occupied with a score of dry plates. Great sensitiveness, perfect keeping qualities, simplicity in manipulation, and, in fact, all the conditions which make landscape photography a pleasure rather than a toil, are secured.

Primarily, in explanation of all this, we should state that Herr Warnerke has discovered a method of making paper supply the place of glass in dry collodion work, with all the advantages which will at once be seen to belong to such a material, without any drawbacks that we can see, and with some superadded advantages which could not have been anticipated. Important amongst the latter we may mention increased sensitiveness. Working with various emulsion processes, he finds that the bromide emulsion on paper is incomparably more sensitive than it is on glass. He finds that it keeps perfectly, examples prepared five years ago working satisfactorily now. We saw a negative developed which had been prepared twelve months, and it was free from defect of every kind. Here are two of the important considerations which concern the photographic tourist—sensitiveness, and good keeping—satisfactorily met. The various collodion emulsions with bromide and bromo-iodide of silver, and the gelatino-bromide emulsion process, have all been tried, and all work satisfactorily on the paper basis which Herr Warnerke has invented. The whole system is singularly ingenious and elegant, and can only be duly appreciated on witnessing the operations and results; but we will briefly indicate details of the process, promising our readers full details from Herr Warnerke's pen in our next number.

We may premise that the completed system is the result of years of experiment, in the course of which various modifications have been found to give good results; but the final mode of working, which we shall describe, gives the best results. Ordinary white enamelled paper is taken, and the edges bent up so as to form a dish, precisely in the manner we indicated many years ago for coating paper

with collodio-chloride of silver. This is coated with plain collodion to which a little of a solution of paraffine in alcohol has been added. As this collodion, when dry, leaves the paper very easily, an edging of varnish is applied, which effectually checks a tendency in the film to leave the paper before required. When the film of collodion is dry, a coating of india-rubber in benzine of about the consistency of ordinary collodion is applied in the same way. When this is dry, another coating of collodion containing castor oil is applied, and after this, when dry, another coating of india-rubber. When this is dry, the sensitive emulsion is applied. The object of applying several coatings, rather than one thick coating, is to secure a more even and perfect film than could be easily obtained by one thick coating. The sensitive coating being dried in the dark, the paper for ordinary purposes is cut up to the requisite sizes, and, with tissue paper between each, stored away for use. It is exposed much in the same way as Calotype paper. When large sheets are used, it is exposed behind glass; small sheets are attached to cardboard, ferrotype plate, or similar substance, without glass in front. Twenty such sheets, attached to ferrotype plate, may be placed in an ordinary dark slide.

The operations in development afford a surprise to the photographer who sees them worked for the first time. The image may be developed on the paper, but this is better avoided. The film is, therefore, removed from the paper. A penknife is slipped under one corner, and the film slips from the paper as easily as we write the words describing it. A plate of glass is made wet under the tap, and the film is laid down upon it without the slightest trouble; and there it remains, without moving, without blisters, wrinkles, or trouble of any kind, throughout the operations of developing, fixing, washing, &c. When washed, a sheet of blotting-paper is placed upon the film, and rubbed down without the slightest fear of injury. In a few minutes it is surface dry, and is placed away between sheets of blotting-paper under slight pressure. When dry—it needs no varnish—it may be handled like a sheet of paper. We saw many scores—probably hundreds—of these negatives stored in books between leaves of plate-paper, all perfect and satisfactory. For printing, it is better to place them in contact with a plate of glass, to which they adhere by atmospheric pressure perfectly, a straightedge covered with cloth or felt being used to rub the film down as a squeegee would be used.

We have referred to the process as applied to ordinary work, in which distinct plates are used; but Herr Warnerke has availed himself of the flexible qualities of paper further. Coating a long slip of paper in the manner described, he winds this upon one of two rollers fixed inside a modified dark slide, attaching one end to the other, so that a certain portion is stretched between them exposed like a plate to the lens. By means of a pinion he can unwind from one roller to the other, and expose a fresh portion, continuously, until the whole is exposed, and one dark slide may easily be equipped with material for a hundred or more negatives. A clever little contrivance permits the operator to see precisely how much he is unwinding, the continuous band being marked and numbered for each space of a negative. A pair of clamping screws keep the band in a proper state of tension. A band of (say) one hundred negatives having been exposed, may be removed from the dark slide and cut up for development as we have described.

Herr Warnerke has used various collodion emulsions, and also Kennett's pellicle, with success. As will be seen, an emulsion not requiring washing is desirable, if not absolutely necessary, and as his experiments commenced at a period long anterior to the discovery of the washed emulsion process, he originally made his emulsion with oxide of silver and bromine, rather than with salts of bromine, and so escaped the necessity for washing

Referring to emulsions, he remarked, that the recently-described process by Mr. Carey Lea might be simplified, as very excellent results in the same direction might be obtained by taking a good sample of commercial bromo-iodized collodion, with additional bromide added, pouring it into a dish until it formed a thick film, then pouring in ordinary negative silver bath, and allowing it to remain until the whole of the salts were converted into bromide and iodide of silver, cutting up the film and washing, finally re-dissolving in ether and alcohol. This gave an admirable emulsion of the character of that recently described by Mr. Carey Lea.

We have very hastily indicated the general characteristics of Herr Warnerke's invention, and the advantages which must attend it. A method of getting rid of the weight, bulk, and fragility of glass is alone a great boon. The freedom from "blurring," by internal reflection, is no light consideration. The possibility of using a curved surface, and so avoiding a multitude of optical difficulties; the possibility of using either side of the negative; the facility for junction in combination printing, and a host of other advantages may be added to the gains of the tourist already indicated. Lastly, Herr Warnerke gives the results of years of experiment to photographers freely, without charge or trammels of any kind, and so lays the whole photographic community under a debt of gratitude which, we trust, they will not be slow in expressing.

URANIUM IN PRINTING.

In Mr. Werge's interesting and comprehensive paper on the photographic uses of uranium, read before the South London Photographic Society, he did not refer specifically to one of the purposes to which uranium may be applied, and, judging by the results of some experiments we made about seven years ago, with every promise of advantage. In the experiments to which we refer, we used the double nitrate of uranium and silver for printing, and obtained fine results with a solution so dilute, that with silver alone we should scarcely have obtained an image. Using a solution containing only five grains of the double salt, practically only about two grains of nitrate of silver, and immersing various samples of plain unsalted paper, we obtained images as vigorous as those ordinarily yielded by a duly salted paper excited on a forty-grain silver bath. The prints were delicate and rich, toning easily in the toning bath of sulphocyanide of gold, but rapidly disappearing in a bath made by any of the usual modes with traces of free chlorine liberated. It is not necessary to repeat all the details here, but those of our readers interested in the question will find particulars in our twelfth volume, p. 421. The chief advantages which might possibly be derived from the use of this double salt would be economy of silver, a simple mode of obtaining good plain paper prints, and a probability of permanency, for as the prints contain no chloride of silver or other insoluble salt, hyposulphite would not be required for fixation. As regards the Wothlytype process, we have a strong conviction that it fell into disuse from commercial causes, rather than inherent demerits as a printing process. Certainly, some of the finest prints we have ever seen were by that method of printing.

FRENCH CORRESPONDENCE.

PHOTOMETERS—BOIVIN'S NEW MANUAL—PHOTO-ELECTRIC PROCESS—ENLARGING STEREOSCOPIES—BOTANICAL PHOTOGRAPHS—THE VIENNA EXHIBITION REPORT—THE MARITIME EXHIBITION AT PARIS.

The great advance which carbon printing has made of late years in France, leading one to hope that its employment will shortly become general throughout the country, has given rise to the want of an apparatus which, till now, has been but little employed: I mean the photo-meter.

For this reason, there is just now a quiet race for popularity among various photographic dealers, and before long we shall have before the public several instruments of the kind. There is the photo-meter of M. Leon Vidal, simplified and improved, an instrument which till now has existed more in theory than in practice; the photo-meter of M. Liebert, and the pocket photo-meter of M. Boivin, suited either for carbon printing, or for the working of dry collodion plates.

Since I have spoken of M. Boivin, I must mention that that gentleman is about to bring out a new and enlarged edition of his work on the dry collodion process, which was first published in 1865. The author has now added to his book a perfect manual upon carbon printing, together with a description of the various processes of photo-electric engraving, photo lithography, and photo-colligraphy. I may be allowed to borrow from the latter portion of M. Boivin's MS. a few extracts which will interest the readers of the PHOTOGRAPHIC NEWS. To obtain what he terms a photo-electric engraving, M. Boivin takes a sheet of gelatinized or albumenized paper, and covers it with a film of gum arabic; he pours over this a varnish of bitumen of Judea and benzole to which a little ether has been added. He exposes the sheet thus prepared under a cliché for a period varying from fifteen minutes to an hour; then he transfers the image by pressure to a metallic plate polished or grained, moistened in the first place with essence of turpentine. He removes the paper by means of warm water, and then develops by means of essence of turpentine containing a few drops of benzole. Finally he washes lightly with a solution of soda or cyanide of potassium, and then a second time with water, and allows the image to dry. To make the varnish more adherent to the bitumen forming the image, it is exposed to diffused light for a few hours. The picture is then engraved either by means of acid or an electric battery, the latter being preferable. By using an ordinary negative, a printing-block in relief may be produced; with a positive, on the contrary, it is an engraved plate that is obtained by this plan of operating. An engraved plate may also be secured with a negative, by covering with a battery the zinc plate supporting the image with a film of copper, employing for the purpose an ammoniacal sulphate of copper bath, or cyanide of copper. The bitumen is removed by means of warm benzole, and then the etching is done, either by using acid, or a battery. In this last process the thin film of copper acts as a reserve, while the zinc is attacked by weak nitric acid. If a positive cliché is employed in this process, then a typographic or relief plate is produced. The bitumen of Judea may be replaced by a carbon print transferred to a grained zinc plate; but, in this case, the gelatine which acts as the reserve is not always sufficiently resistant, and is incapable of supporting the series of operations through which it has to pass. When the deposit of copper has been formed, the gelatine is removed by means of a warm solution of cyanide and of boiling water. The image is then very distinctly visible, appearing damascened in copper upon a zinc surface, and it only remains to etch the block by means of acid. M. Boivin indicates still one other way of obtaining an analogous result, which may be thus described. By means of a battery, a plate of zinc is covered with a thin film of silver. Upon this plate is poured in the dark room an alcoholic solution of iodine; it is then washed, and a tannin or pyrogallol liquid is applied, which is allowed to dry. The plate prepared in this way is then exposed for a few minutes to the sun, after which it is carried into the dark room, and plunged into a gold electrotyping bath, attaching it to the negative pole of the bath. A very curious action then takes place. All the portions of iodide of silver which have been acted upon by the light have become conductors of electricity, and are therefore covered with a deposit of silver, while the other portions act like non-conductors, and repel any metallic deposit. The iodide

of silver is then removed by cyanide of potassium, and the plate is submitted to the etching process; the acid, of course, will not act upon the gold.

On the occasion of the last meeting of the Photographic Society, M. Fleury Hermigis presented a stereoscope with combined lenses, which has the effect not only of rendering the pictures in relief, but depicting them in their natural size. The optical system is composed of two square achromatic lenses of large size, of the same dimensions as the prints, and of two other round lenses, placed in front of the former, and which augment the enlarging power of these. The result of this combination is such, that on looking at the pictures in the stereoscope, it seems as if it is nature itself one is looking at. The stereoscope itself is mounted upon an elegant case, with a drawer to take the prints. It is to be regretted that the system of lenses cannot be adapted to the so-called American stereoscope, which is so simple, and so convenient to use; there exists between the print and the two first lenses but a space of two centimetres about, which does not allow sufficient room for the rotary movement of the prints, and it is to this proximity to the image and the square lenses that the extraordinary enlargement is due. We learn that the photographic staff of the Prefecture of Police is disposed to use this apparatus, which will much facilitate the law in furnishing magistrates and officers with more striking representations of subjects than they have hitherto possessed, in order to come to a decision.

We inspected at the last meeting of the Society some results which if not altogether new, were nevertheless very interesting from a scientific point of view. They were photographs of different plants reproduced of a greenish tint upon a black ground. The plant itself had been placed upon paper prepared with silver salts, and exposed to light, and this formed the cliché. When an ordinary photographic impression has been thus secured, the design, which has been traced by the plant itself, is coloured by means of a chemical reaction; in this way a very exact image is secured, which will no doubt be useful to the herbalist and botanist.

The reports of the different sections composing the international jury of the Vienna Exhibition have been published at last; that of M. Davanne is now in our hands, and one thing strikes us very forcibly in reading it: it is the energy which has been shown among photographers during the past two years. The very conscientious and complete work of our colleague reads like a thing of the past, although the author has in many cases actually predicted the future. What he foresaw has come to pass and is gone, and this circumstance we call attention to, feeling sure that M. Davanne himself will be one of the first to rejoice over the event.

If I may believe the rumours that reached me respecting the Maritime Exhibition which is about to open in Paris at the *Palais de l'Industrie*, and in which a place has been reserved for photography, the collection of objects exhibited is not so extensive as was anticipated. At the same time, I know many artists in the first rank who have promised to contribute, and numerous pictures have been forwarded, which I know will not fail to secure the attention of visitors.

ERNEST LACAN.

THE CORRECTION OF THE CLOCK ERROR BY PHOTOGRAPHY.

BY D. WINSTANLEY.

PHOTOGRAPHY, as the readers of this journal know, is used to make a registration of various meteorological fluctuations; but, so far as I am aware, it has not been used as a means of automatically recording the information needed to correct the error of the clock. An instrument, however, having this for its object is neither difficult nor expensive to construct, and in many localities would still be a desideratum.

Assuming the solar meridian passage to be the phenome-

non it is desired to record, it is simply necessary that the sun should leave some distinctive mark at the moment of apparent noon, together with a record of the time then indicated by the clock. This being done, a few figures only are required to ascertain the error of the clock, and set it right. The equation of time for the day, and the correction for the longitude of the place, are added or subtracted, as the case may be, to or from the hour of twelve, the result being the mean time at which the sun's distinctive mark was left. By comparing this with the indicated time the error of the clock at once is seen.

Regarding the first part of the operation—viz., the leaving an impression at the moment of apparent noon—it is clear that an apparatus must be used into which the sun will shine only at the time required. A metallic tube mounted like a transit instrument could evidently be made to perform this office, but the necessity for almost daily alterations in its elevation to suit the varying declinations of the sun, and the use of a graduated arc to make them, are objections to its use. Two discs of card or metal, in the form of quadrants, fixed parallel with each other, and having a diaphragm in the form of an elongated slit connecting their curved edges, would answer no less efficiently than the tube, and without the necessity for alteration.

At the angle of the discs—i.e., the centre from which their curved boundaries are described, and between the two—must be placed a stop, perforated by two holes, whose line of juncture is horizontal, and whose distance from each other such that the sun's rays may shine through them simultaneously for only a brief increment of time. A strip of photographic paper placed behind this stop would then receive, about the time of noon, a strong impression through one hole; a little later, a momentary one through both; and a final impression through the second one alone. Now, if this strip of paper be allowed to move with measured speed the while, lines will result from the action of the sun as thus:—



That portion of the paper where a single line is seen indicating that at the moment of its passage underneath the stop the time of noon was passed, or had not yet arrived, whilst the centre of the part on which two lines are found shows that the moment of its passage took place upon the stroke of noon.

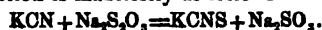
The remainder of the apparatus will be obvious at a glance, consisting merely of a cylinder round which to fold the photographic strip, and a clock attached thereto to indicate, according to itself, the time at which a given portion of the strip passed by a given point.

Such an instrument I am now constructing. Its quadrants have a radius of a foot; the distance of their separation is an inch; the width of the slit the tenth part of an inch; the inclination of the diaphragm thirty-six degrees above the horizontal plane; and the separation of the holes therein one-fifth part of an inch. The diaphragm will be situated immediately above the external surface of a cylinder having a diameter of one foot, and connected with the minute spindle of a clock, so as to revolve therewith completely in an hour. The sensitized paper wrapped round this cylinder will be protected from the influence of any light save that passing through the pinholes of the stop. The diameter of the cylinder is such that over one yard of paper will pass the diaphragm in an hour, or a little more than six-tenths of an inch per minute, so that with a reading reliable only to the tenth part of an inch—a very easy reading—the time will be indicated to within ten seconds of the truth. By applying another and much smaller cylinder to the spindle of the crown wheel, the indication may be readily obtained to within one vibration of the pendulum.

NOTE ON THE PRODUCTION OF SULPHOCYANIDES.

BY JOHN SPILLER, F.O.S.*

THE use of sulphocyanide of ammonium as a fixing agent in photography, proposed in the year 1863 by M. Moynier, of Marseilles, does not appear to have been generally received with so much favour as to induce manufacturers to turn their attention to the economical production of this salt. It may still be regarded as a laboratory preparation; and the comparatively high price is no bar to its employment in the gold-toning bath, for which purpose alone it seems now to be reserved. Very recently M. Jacquemin has communicated to the French Academy† a process, or chemical reaction, by which two fixing agents now employed in photography may be made to produce a third. The object was not so much to produce the sulphocyanide of potassium directly in this manner, as to take advantage of its formation as a means of detecting the potassium cyanide in the presence of non-poisonous double cyanides. By boiling together sodium hyposulphite ($\text{Na}_2\text{S}_2\text{O}_3$) and potassium cyanide (KCN) the S_2 divides itself equally between the two salts, forming sulphocyanide of potassium and sulphite of sodium. The chemical reaction is manifestly as follows:—



To put this to the test of actual experiment, I boiled 4 oz. of the hyposulphite with about 1 oz. of Liebig's cyanide of potassium dissolved in half a pint of water. The odour of prussic acid soon disappeared, and after five minutes' boiling the change was completed, the solution now giving the characteristic blood-red colouration with ferrous chloride. It was decidedly alkaline, and fixed both paper prints and collodion negatives in a satisfactory manner, although much slower in action than the original cyanide.

There does not appear to be much difference in the behaviour of the potassium and ammonium sulphocyanides when employed as fixing agents; but if the latter be preferred, it may be well to remember that vast quantities of this salt are being thrown away in the waste liquors from gas works, and that, after recovering the ammonia, no use is made of the sulphocyanide still left in solution. This could be precipitated with mixed iron and copper salts, and the white cuprous sulphocyanide economised for the production of the corresponding alkaline salts. Already I have tried this process on the small scale, and it appears to answer perfectly.

THE ADVANTAGES OF SULPHOCYANIDE OF AMMONIUM AS A FIXING AGENT.

BY GEORGE HOOPER.*

IN order to be explicit in communicating a few remarks upon the above subject, I have thought it advisable to divide the same into five headings, as follows:—First, to consider the matter historically; secondly, chemically; thirdly, theoretically; fourthly, practically; and fifthly, economically.

Sulphocyanide of ammonium, as a fixing agent, both for prints and negatives, was first made known to the photographic world by M. Moynier, of Marseilles, who laid the matter before the Society, and succeeded in getting an experimental committee appointed to report upon the subject, as far back as the 9th January, 1863. This report was given about three months later; and on the 22nd of the same month a very interesting and practical paper was read before the late North London Photographic Association by Mr. G. Wharton Simpson. During the twelve years that have elapsed little has been said upon the subject; and, in order that it may not collapse until it has been much more fully investigated than has yet been the case, I have thought it advisable to bring it prominently and forcibly before the Society, in

hopes that our practical and experimental members will take the matter up with spirit, and decide definitely which is the most perfect fixing agent for photographs—hyposulphite of soda, or sulphocyanide of ammonium. Having the conviction that the immediate future of photography lies more in the perfecting of the silver process than in the adoption of carbon printing (I mean for small work and small commissions), I feel it an important step in the right direction if we can find an agent that shall more thoroughly dissolve out the silver left in the prints after toning than is the case with hyposulphite of soda. It is my conviction that photographers generally have stuck to the use of hyposulphite of soda chiefly on economical grounds; but if it can be shown that this substance, by a very general consumption, can be produced at a price that will favourably compete with hyposulphite of soda, this consideration will be entirely swept away—although I must add that I think it is one that should always be held as of very secondary importance.

I shall now say a few words upon this substance chemically. It is a notorious fact that many disputes arise in our photographic journals through very different results being obtained by the same formula; whereas the solution of the problem is simply in the fact that one person is using everything of the purest kind, whereas the other party has a very inferior article; and I was informed by Mr. H. Cooper, only last December, that a certain process of obtaining good albumen transparencies for enlargement was an entire failure in the hands of many who had purchased a certain process, simply on account of the difficulty of obtaining the purest albumen in country towns.

Perhaps I cannot better illustrate the above remark than by the three samples of sulphocyanide of ammonium I have laid upon the table, obtained from two different manufacturers. One I have marked as an *impure* sample, another is shown as the *crude* sample, and the third as the *pure* article. Now the first of these has such an excess of sulphur left in it that it makes it impolitic to use it at all as a fixing agent for prints. I found it answer for negatives instead of cyanide of potassium; but considerable washing and a second application are required; not so the other two samples. Sulphocyanide of ammonium is composed of sulphur, hydrocyanic acid, and ammonia, and is obtained by neutralizing hydrosulphocyanic acid with ammonia and evaporating gently to dryness, or digesting hydrocyanic acid with sulphide of ammonium, and boiling off any excess. There are various other ways, but this is how it may be obtained in the laboratory.

I shall next touch upon it theoretically. That sulphocyanide of silver is formed by the immersion of the toned prints is the *primary* action, and that a double salt is afterwards formed through the excess of sulphocyanide of ammonium is the *secondary* action, and that a certain small amount of sulphocyanide of silver (which is insoluble in water) may ultimately remain in the prints is the *final* result.

This leads me to my fourth heading, namely, the consideration of it in its practical bearings; and the following question naturally arises, that supposing, for sake of argument, a small trace of undissolved silver be left in the prints, which is the lesser of two evils: to have a small portion of sulphide of silver left in the prints, or a small amount of sulphocyanide of silver? Although this may be a somewhat difficult question to settle off-hand, yet I ask whether some of our experimental chemists cannot decide the matter for us definitely, and even find a substance that shall be capable of entirely dissolving out this objectionable product, and yet leave the print in possession of all its beautiful qualities as regards tone and brilliancy?

However, it is open to dispute whether there is really the slightest trace of sulphocyanide of silver left in the print when the operation of fixing has been carefully and properly conducted; and on this point I shall quote rather fully from Messrs. Davanne and Girard's researches, who

* Read before the Photographic Society of Great Britain.
† Comptes Rendus, lxxix. p. 1599.

were two of four gentlemen appointed as an experimental committee to test the properties of sulphocyanide of ammonium as a fixing agent, and who, trying its action upon albuminate of silver, found that it was much more energetic as a fixing agent than hyposulphite of soda. "If a certain quantity of albumen be precipitated directly by nitrate of silver, and, after the precipitate is washed and treated two or three successive times by sulphocyanide of ammonium, the residue carefully washed, we recognise that this residue, dried and calcined, leaves only very minute quantities of silver in the ashes; whilst in operating in a similar manner with hyposulphite of soda the ashes contain relatively considerable quantities of silver. The sulphocyanide of ammonium appears, therefore, to present a real superiority over hyposulphite of soda in respect to the absolute fixing of the whites of the prints."

Again, in another article, M. Meynier states thus:—"Sulphocyanide of ammonium dissolves the silver compounds employed in photography very readily; and its most remarkable property with respect to the permanency of the pictures is, that notwithstanding the presence of sulphur among its elements, it does not precipitate that element under the action of acids, which is the primary cause of the fading of prints fixed with hyposulphite of soda. To verify this property, a saturated solution of hyposulphite of soda was placed in one test glass, and a saturated solution of sulphocyanide of ammonium in another. A drop of acid added to the solution of hyposulphite of soda caused an abundant white precipitate of sulphur. The solution of sulphocyanide of ammonium similarly treated, on the contrary, remained limpid. This limpidity was not changed under the action of a very strong proportion of acid. The liquid only became feebly coloured yellow-red. From this fact it evidently results that sulphocyanide of ammonium does not precipitate sulphur under the influence of acids; and, admitting that some sulphur must be liberated, soluble compounds only are formed, which will be removed by washing, and leave no sulphur in the substance of the paper."

Again, in a very comprehensive article upon the same subject, published first in the *Bulletin* of the French Photographic Society, and afterwards in the *Photographic News* of May 1st, 1863, we find the following remarks by Messrs. Davanne and Girard, beginning with the question, "Can sulphocyanide of ammonium dissolve all the silver compounds? We have no hesitation in replying in the affirmative. "For a long time it has been known that the alkaline sulphocyanides dissolve the salts of silver. This fact is recorded in all treatises on chemistry; but experiment has shown us that its solvent faculty is more absolute than that of hyposulphite. The action of this salt upon nitrate and chloride of silver is more decided, as every one may ascertain for himself. Take a solution of nitrate of silver, and pour into it some drops of the alkaline sulphocyanide, a white precipitate of sulphocyanide of silver will appear; upon adding an excess of the reagent, the precipitate will quickly disappear. Chloride of silver, shaken into a solution of sulpho-cyanide, is dissolved in the same manner. The clearness of these two reactions admits of our passing them over quickly; we therefore devoted all our attention to the solution of albuminate of silver. We recognised that the solution was complete, and that the action of the sulphocyanide was, from this point of view, even more energetic than that of hyposulphite of soda. For, on the one hand, we precipitated some albumen by nitrate of silver; then, after well washing the precipitate with distilled water, we treated several times one portion with sulphocyanide of ammonium, the other with hyposulphite. Again well washed, the precipitates were well calcined. That which had been treated with sulphocyanide furnished traces of silver only; whilst that treated with hyposulphite furnished a considerable quantity. On the other hand, we fixed, by means of these two agents, some albumenised paper, which we afterwards burned; and in

this case we recognised a difference of the same kind quite favourable to the employment of sulphocyanide, but which was less marked than in the first case. Thus sulphocyanide attacks albuminate of silver more energetically than hyposulphite, and consequently presents a decided superiority over the latter with respect to the absolute fixing of the whites of the prints."

Sulphocyanide of ammonium, in conjunction with chloride of gold, makes an excellent toning bath, the best proportions being 6 grains of the former to each grain of gold. The fixing bath should be used very strong, say one part of sulphocyanide to two parts of water; and whilst the first should be thrown away after the prints have remained in five minutes, the second bath of the same strength may be preserved, in order to be used as the first bath for the next batch of prints. Five minutes in each bath will be found sufficient, provided that the prints are well washed between the two fixings. It has been proved to be more economical to use a solution of this strength, and it will not be found to reduce the prints more than the ordinary hyposulphite bath.

For fixing negatives, sulphocyanide of ammonium is to be strongly advocated, in preference to cyanide of potassium or hyposulphite of soda.

Make a saturated solution, and keep it corked. It will be found as energetic as cyanide (no offensive smell); and most authorities declare it to be innocuous, though upon this point I cannot speak positively, and do not care to try the experiment just yet.

Lastly, a few words upon economical grounds, as compared with hyposulphite of soda. Although, as I have stated before, I consider this a secondary matter, yet we can live in hopes, if not upon hopes. Hyposulphite of soda was once a guinea a pound, and is now less than a guinea per cwt; but this is not so much on account of the few tons used by photographers, but by the many tons used by calico-bleachers and paper and cardboard manufacturers.

Sulphocyanide of ammonium can be produced from gas refuse in large quantities—in fact, gas liquor is at present thrown away as a useless article; but if some enterprising firm will only take the matter up and make a few tons, there is little doubt but that it would entirely replace cyanide of potassium, and, to a great extent, hyposulphite of soda. Sulphocyanide was sold in Paris twelve years ago at about 1s. 1½d. per pound; and although one sample upon the table cost 3s. per pound, and the pure sample 4s. per pound, yet I consider the latter the cheaper of the two on account of its purity. But there is no reason why it should not be greatly reduced in price, if photographers will only wake up and use it generally. I have been informed by Mr. John Williams that a patent has recently been taken out for making Prussian blue from this material; and if a really good blue is attainable, which appears very probable, there is little doubt but that sulphocyanide of ammonium will come down in price to about 4d. per pound, instead of 4s. per pound.

In conclusion, I ask the opinion of photographers generally whether sulphocyanide of ammonium is not a more perfect fixing agent for prints than hyposulphite of soda when properly used; and whether there is any necessity whatever for the continued use of that objectionable, poisonous, and even costly chemical, cyanide of potassium, for the fixing of negatives.

Why not banish it from our midst? Only try sulphocyanide of ammonium, and I feel confident this will be the result. Then shall we have no more heart-rending stories of accidental or non-accidental death by poisoning with cyanide of potassium; the manipulatory part of the art will be made less unwholesome; and all these advantages will be realized without a single disadvantage to counterbalance the recognised gain.

ON AMMONIO-SILVER CARBONATE.

BY SERRIUS KERN.*

By adding, to a concentrated solution of silver carbonate (Ag_2CO_3) in ammonia, ethyl-alcohol ($\text{C}_2\text{H}_5\text{O}$), a peculiar grey precipitate is received, containing the elements of ammonia. In order to study the reactions and the nature of this compound, some experiments were made, the results of which are as follows:—

The silver carbonate was prepared by mixing concentrated aqueous solutions of hydric sodium carbonate (HNaCO_3) and silver nitrate. The yellowish precipitate of silver carbonate obtained was well washed and dried over sulphuric acid; the dried salt was dissolved in ammonia, 0.930 sp. gr., and from this solution the ammonio-silver carbonate compound was thrown down by means of absolute alcohol; the resulting grey precipitate was washed and dried. The ammonio-silver carbonate thus obtained gave the following reactions:—

(1). The compound in the state of perfect dryness takes a more intense dark colour; some drops of ammonia immediately turn the substance black, and readily dissolve it.

(2). Gently heated to 80° , it commences to yield ammonia gas, which disappears at 100° . This was proved by placing on the top of the crucible red litmus paper, which turned blue. Some drops of hydrochloric acid gave, with the evolved gas, white fumes, proving the gas to be ammonia.

(3). Two grms. of the substance, heated on a sand-bath in a porcelain crucible at the following temperatures, undergoes the following changes:—

100° ...	The substance blackens.
160° to 170° ...	Conversion into a uniform black mass.
240° ...	The substance partly whitens from the decomposition into metallic silver.
305° ...	Conversion into metallic silver.

(4). A solution of ammonio-silver carbonate in ammonia, dried over calcium chloride, gives needle-shaped crystals of irregular form. The crystals dissolved in ammonia turn black, and the undissolved part falls down in the form of a black powder.

(5). The ammonio-silver carbonate, in the form of a black powder, resulting from the experiment No. 4, was dissolved in hydrochloric acid. There was a strong reaction, evolution of gas, and production of silver chloride (AgCl) and of a small quantity of neutral ammonia carbonate $[(\text{NH}_4)_2\text{CO}_3]$, by the following reaction:—



The presence of the ammoniacal salt was proved by testing the salt by means of a concentrated solution of sodium hydroxide (HNaO); ammonia gas was received from the decomposition of the salt:—



(6). The ammonio-silver carbonate may be considered as a direct compound of silver carbonate and ammonia, having the formula $\text{Ag}_2\text{CO}_3 \cdot \text{NH}_3$. At ordinary temperatures, this substance is a stable compound, which may be preserved for a long time without alteration; but, as it is seen from the experiments, it is readily decomposed by the action of heat and acids, with the evolution of ammonia gas.

Correspondence.

DOCTORING BATHS.

SIR,—Has any one ever tried the experiment of doctoring refractory baths on homœopathic principles?

The question was suggested upon reading Mr. Turnbull's amusing and instructive article in the *News* of last week, in one part of which he relates the incident of the woman who upset his bath, developer, &c., in a coal house, and, gathering the different solutions in the bath holder, consoled him with the remark: "I don't think you have lost any, as it was spilt on the table, and I gathered it all into the dish with my hand again!" Mr. T. further states that he filtered it, and, upon trying a plate, found, much to his

surprise, that it worked as well as ever. The paragraph is concluded with a recommendation to try a little iron solution to a disordered bath. Now, though it seems a strange theory, I think a great deal may be gathered from the foregoing fact, which might be improved upon, if followed up by some of our indefatigable experimentalists.

Trusting we may hear further from homœopathic practitioners of our fraternity, I am, sir, yours obediently,
THOS. PROTHROE.

TRANSIT OF VENUS.

SIR,—There must be some mistake in the telegram from the American transit of Venus party here alluded to in your paper of 18th December, as the number of good pictures was 113, about 170 having been taken altogether. This I happen to know, as I was assisting in the photographic house. The sky was obscured for weeks prior to the transit, and was only clear on that day for a short time, none of the contacts being sufficiently clear to make any reliable observation with the eye, and, of course, impossible to be registered by photography. From practice beforehand we found we could take twenty-five views of that portion of the sun's limb on which the planet would appear (one inch square) in thirty-nine seconds. The diameter of the sun's image was about four inches. This rapidity was attained by the use of an apparatus designed by Professor Harkness for use at the time the contacts were taking place.—I remain, sir, yours faithfully,

C. McMAHON, Major, Royal Artillery.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting, being the concluding meeting for the present session of this Society, was held on the evening of Thursday, the 10th inst., Mr. F. YORK in the chair.

The minutes having been read and confirmed,

Mr. WILLIAM BROOKS read a paper entitled "A Novel System of Masking, and the Production of Brilliant Prints from Weak Negatives" (see page 292).

The CHAIRMAN, in moving a vote of thanks, remarked that the process seemed to be one of great value. The hard lines of junction in combination pictures were often very objectionable; but by adopting the method recommended in the paper to which they had just listened, they would be done away with. He could see several ways by which the suggestions could be utilized; he might give, as an instance, the lightening up of dark foregrounds.

Mr. WILKINSON thought that the matter had been presented with such completeness as to leave no room for discussion.

Mr. BROOKS said that he had found the process was useful in the case of very thin negatives, as well as for imparting artistic effect to such subjects as drapery. Mr. Brooks then gave a practical demonstration of the method of removing any portion of a picture by means of an application of cyanide of potassium, handing the pictures thus operated on around the meeting for examination.

Mr. AYRES asked if there was not a difficulty in effecting the complete removal of the cyanide of potassium from the mask.

Mr. BROOKS said that this could be easily done by washing well with a brush. There was no danger of the cyanide acting upon portions upon which it had not been applied.

Mr. WERGE considered that in this process Mr. Brooks had allied the art of photography to the art of painting. He (Mr. Werge) recommended the application of plumbago by a stump to the back of the negative, as it was more under control. They could distribute or blend it away as they liked. The subject was then dropped.

Mr. WERGE then read a paper on "Uranium and its Uses" (see page 291).

The CHAIRMAN had never tried uranium except as an intensifier with ferrid-cyanide of potassium, when he found its use not to be commended.

Mr. BROOKS agreed with all Mr. Werge had said respecting the alleged accelerating influence of an addition of nitrate of uranium to the negative bath; the only effect produced was to render it slower.

After some remarks by Mr. Tulley, Mr. Kennett, and others,

* *Chemical News*.

Mr. WARNERKE said that if red uranium prints were flowed over with sulphuric acid and bichromate of potash they would vanish; but, on being treated with solution of citrate of aniline, they would re-appear of a black colour. A print of a greenish-black colour would be turned into one of a purple colour by solutions of the alkalis.

A vote of thanks was then tendered to Mr. Werge.

Herr LEON WARNERKE then described an important mode of working with bromide and other emulsions on flexible supports, and an apparatus for working such films; and gave a practical demonstration of the process. This communication was delivered extempore; but a request having been made that it should be reduced to writing and published *in extenso*, it was agreed that it should assume this latter form, when it will appear in our pages next week. The communication was very interesting, and the thanks of the meeting were cordially given to Mr. Warnerke.

The SECRETARY announced that the next ordinary meeting would be held on October 14th. The meeting then adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The third out-door meeting of this Society was held on Thursday, the 10th inst., at St. Monance, in Fife. The members left the Waverley Station at 6.30, and arrived at their destination about 9 o'clock. Breakfast, of course, first claimed their attention, and for that purpose they proceeded to McFarlane's Hotel, where, in spite of the rather unpromising appearance of the exterior, they were sumptuously entertained.

St. Monance is a quaint, clean-looking fishing village, with a population considerably above the average of such places in appearance and industry; and affords much picturesque work for the camera, in the shape of fine combinations of rocks and water, while the harbour, with its fleet of fishing boats, affords scope for many excellent pictures. It possesses also a tolerably fine ruined castle and round tower, which may be combined with much pictorial advantage from several points of view. The glory of St. Monance, however, is its ancient church, one of the oldest in Scotland, and in a fairly good state of preservation, and as the sea at high water almost washes its base, it is a never ending source of admiration to visitors, and is always eagerly seized on by all artists, whether they rely on the brush or the camera.

The cameras of the party were, very naturally, first turned in the direction of the church, and then each betook himself to the kind of subject most congenial to his taste, or best suited to the size of plate which he was working, and so the day was pleasantly spent until dinner time.

The weather, which looked gloomy and dull in the morning, fortunately took a favourable turn, and they had the advantage of fine sunshine, tempered with masses of white clouds during the whole day. The wind, however, was rather high, but as there were no trees, the only danger was in the possibility of the cameras being shaken, and, judging from the results, that, by the aid of pretty heavy stones, &c., seems to have been generally prevented.

At three o'clock they sat down to dinner, which was served up by Mr. McFarlane in capital style, and very thoroughly enjoyed. After dinner the members constituted themselves into an ordinary meeting of the Society, with the President in the chair; but the business transacted was simply of a routine character. On comparing notes, it was found that, in all, forty plates had been exposed, including Davies' beer and albumen; Captain Abney's modification thereof; collodio-bromide emulsion, and plain beer; and we understand that fairly good results have been got by all.

The homeward journey was commenced at 4.30, and the party arrived in Edinburgh at 8 o'clock, very much pleased with the excursion, and very hopeful of satisfactory negatives.

We understand that the annual holiday, which has apparently become one of the Edinburgh institutions, is to take place on the eighth of July, and that the excursion will be, as usual, by barge, to Almond Dell.

Talk in the Studio.

A DIPPER FOR FLAT BATHS.—A correspondent of our Philadelphia contemporary gives the following:—"Get two pieces of heavy silver wire (or steel wire tipped at the ends with silver) about two feet long, bend in the shape of a U or a long horse-shoe, turning up the ends about one-fourth of an inch; next drill two holes in each piece on opposite sides about three or four inches from the top of curve (wires being flattened, if necessary). Slip one of the

wires inside of the curve of the other, so that the four holes will correspond, and run a small wire through, and bend both ends to prevent its slipping out. Your dipper is now complete, and has the appearance of the following figure. Collodionize



your plate, and place it in the dipper face down, and grasp both curves in one hand, and you will find that the plate is firmly held without effort, and may be immersed vertically or diagonally as preferred, the ends of the dipper forming rests for the plate while in the dish. When coated, it can be raised, drained, and placed in the holder without the least trouble."

PRODUCTION OF OZONE.—Ozone may be easily and abundantly generated in any apartment by means of an aqueous solution of permanganate of potash and oxalic acid. A very small quantity of these salts, placed in an open porcelain dish, is all that is necessary, the water being renewed occasionally as it evaporates. Metallic vessels should not be used.—*Scientific American.*

BLEACHING BONES AND IVORY WITH OIL OF TURPENTINE.—Bones exposed three or four days to sunlight in oil of turpentine are bleached perfectly. They should rest on little blocks to keep them out of the acid products which settle on the bottom.—*English Mechanic.*

To Correspondents.

S. P. Q. R.—Matt silver stains, such as you describe, may be induced by various causes, but the primary and most frequent cause is the use of a horny, repellent collodion, upon the surface of which the free silver solution is apt to stand in pools and rivulets, rather than to flow in an even sheet. The silver solution rapidly concentrates and dries, especially in warm weather, and so causes stains by the reduction of silver into the metallic state. One very simple and sweeping remedy is the use of another sample of collodion which is free from the tendency in question. The same sample of collodion when older will get rid of this tendency. The addition of one or two drops of water to each ounce will often effect a cure. Immerse the plate as soon after coating as possible. Allow as little time as possible to elapse between removing the plate from the bath and developing. Be very careful to keep the inner frames of the dark slide clean. Place a fresh piece of clean blotting-paper at the corners of the dark slide with every plate. Place a piece of wet blotting-paper at the back of the plate. It is probable that by attention to these hints you will get rid of your trouble.

ONE IN THE TRADE.—The stops should be central to the lens. It does not follow that because the aperture is not quite in the centre of the piece of brass that it is not opposite the centre of the lens. See to that. 2. The scratches would have been better absent, because by dulling the surface at the point in question they obstruct a small amount of light; but the amount is probably so infinitesimal that you will not perceive any difference in working. 3. About opposite the breast of the model is the best position for the lens in taking standing figures. The sliding front is of great value, but a swing-back is not of much use with small pictures.

A. C. SUEC.—We should think Mr. Morley probably most likely to apply to; but we do not know of any one who makes a speciality in dealing in second-hand lanterns.

R. P.—We do not quite see where your difficulty is in getting an even coating, unless you use the solution too thick or too cold. It ought to be easy enough to spread. Herr Warnerke's paper may afford you some hints. See leader.

W. G. A.—The collodion you describe is probably useless. We do not know of any efficient method of reviving the sensitiveness of "old brown collodion giving an insensitive, rotten film." You may find it useful in some cases to add to a new tough sample inclined to fog from want of ripeness. Such a collodion as yours will aid in ripening a new sample. It is, as you suggest, useful in cleaning plates, but in such case it is painful and sometimes injurious to the eyes. 2. It is possible to take interiors with a single lens. Place the stop very close to the lens. This will tend to correct curvature of marginal lines, whilst it increases curvature of the field, which is not an evil in an interior.

M. F.—The toning bath which has turned a dirty brown and refuses to tone is useless. You have probably touched the solution with fingers contaminated with hyposulphite of soda, which has decomposed the solution. Fingers which have been in contact with hypo should be thoroughly washed before they touch anything else.

Several Articles in type are compelled to stand over for want of space.

Several Correspondents in our next.

The Photographic News, June 25, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE STATUS OF PHOTOGRAPHERS—THE INTENSITY OF DIFFERENT COLOURED LIGHTS.

The Status of Photographers.—The status of photographers, a subject which has many times been discussed in these columns, is just now being ventilated by our Austrian brethren in Vienna. Dr. Vogel, of Berlin, recently set the ball rolling in a paper he contributed to the *Photographische Notizen*, and which we reproduced in this journal some months ago, and the point seemingly under discussion is, whether the position of photographers would be raised by establishing an academy or college for instruction in matters of which all those connected with photography should know something. It is in respect to art culture especially that the photographers of to-day are said to be so sadly deficient; but—so one party argues in the Viennese journal—as there already exist schools of art in every large town, what on earth do photographers require farther? As regards chemistry and optics, they may acquire a knowledge of these at any science college, and thus photographers may easily pick up their acquirements if they will only take the trouble to do so. It is here, however, that the difficulty lies. A new generation of photographers will be necessary before we can expect much change in the manner in which they acquire their knowledge, and even then it is questionable whether any good would be gained by establishing a special academy for disciples of the camera. It has been advocated by some in the columns of this paper that, if not a college, certain series of lectures might be given by those competent, in order to diffuse a knowledge of the art, and thus elevate those in the profession. There are, of course, two distinct branches of knowledge a successful photographer must attain to: he must be conversant, at any rate, with the elements of chemistry, and be careful and skilful in his chemical as well as his photographic manipulations, and he must be, moreover, a tolerable artist. Although there are numerous schools and colleges open to him in this country where he can acquire a knowledge both of theoretical and practical chemistry, there is, we believe, scarcely one professor of photographic chemistry to be met with in London, holding a position similar to that of Dr. Vogel in Berlin, or M. Davanne or M. Aimé Girard in Paris. Chemistry is such a broad science, and is every day becoming so much broader, that in the event of one desiring to devote but a year or two to its study, one must needs attach to but one single branch or twig of the great tree. And if one desires to become a photographer, and has much to learn besides in the matter of art and manipulation, then it is impossible to give up very much time to chemical science. For this reason, instruction merely in matters bearing upon photography is all that photographic students can be expected to attend, and a competent professor of photographic chemistry would on this account be welcome among us. Another suggestion, which has found advocates both in this country and abroad, has been that some institution or congregation of photographers, like the societies that at present exist, should appoint an examining board, and grant certificates. This is a plan, however, which involves many difficulties. If certificates were to be granted to photographers, it could only be on account of their artistic taste and skill, and as these are matters of which there exist already recognized judges, certificates granted by any but such well-known men would be of no avail. If, for instance, a society numbered among its members Royal Academicians and Associates, or other well-known portrait and landscape painters, certificates from such as these would be, indeed,

of value, in the same way as the medals and other distinctions granted by the Academy; but if only conferred by men who have not won distinction before the public, either as photographers or painters, then the award is only worth the money-value it represents. Such degrees, or fellowships, or certificates, whatever they might be termed; would aid little in advancing a photographer, for the public would always go to those who gave them the most pleasing pictures, whether they were certificated members of a society or not. The great misfortune just now is that the public taste as regards photography is at rather a low ebb, and it is well known that of two cabinet portraits, one (say) executed by Rejlander, and the other in the French style, highly retouched, with burnished surface and a smart coloured line round the margin, like a fancy sketch for a showy bon-bon box, most of the British public would prefer the latter to the former, exactly in the same way as reproductions of lithographic drawings with high and sharply-defined mountains and copious waterfalls always find a ready sale before true photographs of the scene where the natural phenomena are not so much pronounced. It is to circumstances like these more than any other that must be attributed the disregard for art study which so many of our photographers show, for with them, as with most people, it is that which brings in the most ready money to which they pay most attention. And if a brilliant, worked-up portrait, in which the face is rendered as white and even as ivory, and the moustache of a dark jet black, finds a more ready sale than one which has less violent contrasts, and is far from uniform as regards face and complexion, then it is only natural that photographers should produce such articles as are most in demand. No doubt a series of good lectures and demonstrations, delivered by competent professors, would aid much in bringing about a better state of things, but it rests in the main with photographers themselves to work out the problem, and to teach the public to like something better than the pictures they are now in the habit of buying.

The Intensity of Different Coloured Lights.—An experiment recently made at Trieste to test the intensity of various coloured lights is worth recording in these columns, as it is naturally a matter of some interest to photographers. The experiment was a practical one, and designed for the purpose of discovering how far lights of different colours penetrate darkness, and whether they would be of any value for the lanterns of lighthouses. Of course a white light is seen at a much greater distance than any coloured illumination, and it is singular, too, as many of our readers have, no doubt, remarked, when viewing a fountain illuminated by various colours, that when the white light is thrown upon the drops these appear at their best. At first we may admire the violet; then a ruby light is thrown upon the falling water, and we pronounce in favour of that; then, perhaps, green, orange, and blue illumination follows, all securing our admiration in turn, until, at last, the white light is again turned on, and its brilliancy and intensity give at once finer effects than the others. In the experiment at Trieste, half-a-dozen lanterns, with carefully selected glass, and all furnished with oil and wicks of a like character, were set burning on the beach, and then observations were taken by a party of sailors in a boat. "At half a league distant the dark blue lantern was invisible, and the deep blue one almost so, so that there could be no doubt as to their unserviceableness for lighthouses or beacons. Of all the colours, the green was visible for the longest distance, with the exception of the red, which ranked next to the white in brilliancy. It is only the green and the red—such, indeed, as our railways make use of—that are capable of employment, and the green light the Trieste authorities only recommend in the vicinity of white and red lights, as from a short distance an isolated green light begins to look like a white one."

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER VIII.

THE DEVELOPER AND DEVELOPMENT.

WITH SOME SPECULATIONS ON THE NATURE OF THE INVISIBLE IMAGE FORMED IN THE CAMERA.

DEVELOPMENT is one of the most beautiful of the photographic manipulations. It is performed in non-actinic light, as was the sensitizing of the plate, and the operator has been careful that his plate has not been exposed to actinic or white light, except in the camera, where it has undergone a change of the nature of which we cannot be said to have any exact knowledge. Looking at the plate, we can discover no perceptible alteration in the film; no image is visible; yet an image is latent, and the developer brings it out. On the skill and intelligence of the operator in this manipulation depends the success of all the work that has gone before—his to mar, and, to a certain extent, in some cases, to correct. That the reader may understand how important development is, and that he may bring to bear all his knowledge in the operation, let us consider the effect of the developing and fixing solutions on the unexposed and exposed films of collodion sensitized in the nitrate of silver bath.

Coat a glass plate with collodion, and sensitize in your negative bath. A coating of iodide and bromide of silver is formed on the surface, and the plate is moistened with nitrate of silver. If (this operation having been performed in a room, as your dark room should be, free from actinic light) you now flow the plate with a solution of sulphate of iron in water, you can observe the silver in a metallic state floating about on the surface of the plate. By washing the plate under the tap, all the "free silver," as it is termed, will be washed off. Place it immediately in a solution of cyanide of potassium or hyposulphite of soda, and the surface of the plate will be left very much in the state it was when the collodion was poured on.

Sensitize another plate, and before pouring on the solution of iron in water (the *developer*), expose the plate to the actinic rays for a few seconds. Bringing back the plate to the dark room, we can perceive no change in the film; yet a remarkable change has taken place, for, on applying the developer, we perceive that, although the silver is reduced, as on the other plate, instead of its floating about the plate as before, a portion of it is attracted to the film and is deposited there, and the plate is seen to darken and grow opaque. Only a portion of the silver, too, can be washed off under the tap; and the plate being placed in the solution of hyposulphite of soda (which has not the property of dissolving metallic silver), it remains unaffected.

Once more taking a sensitized plate and putting it in the carrier, by half opening the slide we expose one-half of the plate. Now, on developing, we find one half (that exposed) darkens by the attraction of metallic silver to its surface, while on the other the silver floats about in a free state. Washed and placed in the hyposulphite of soda solution, the exposed half will be found to have an opaque film, as the plate of the second experiment, while that half of the plate unaffected by actinic light will have an appearance much as it had when first flowed with collodion, and like the plate of our first experiment.

By this it will be seen that, all the conditions being identical, actinic light must have worked this marvellous change; and on this, it may be said, is photography based.

When the plate is first exposed in the camera, it receives, by the action of the actinic rays, an impression on its surface; and the developer discloses this, the reduced silver being attracted to those parts affected by the light. There is now remaining on the parts of the negative unaffected by light, iodide of silver; and unless this is dissolved and removed, the image is in danger of being obliterated by the action of light; and the shadows being opaque, the passage of light in printing is prevented. This dissolution of the iodide of silver in the solution of hypo-

sulphite of soda or cyanide of potassium is termed "fixing" the image, after which it is well washed under the tap.

It has been seen that the action of light on the sensitized plate has caused no perceptible change in its appearance, nor can any be detected by the aid of the most powerful magnifying glass. That a change of some kind has been effected is proved by our experiments, and the fact has been established that the impression is not of a temporary character, plates having been developed months after exposure, and with perfect success, provided always that the plates have been protected from actinic light in the interval.

What, then, is the nature of the invisible image? All that is advanced on the subject is a matter of conjecture. These theories may be briefly given:—1. That during exposure of the plate, a reduction of a small part of the iodide to the metallic state accelerates and directs the subsequent reduction caused by the iron developer. 2. The reduced silver forming the image under the action of light in the camera is produced instantaneously, and the free acid of the nitrate of silver solution in the film tends to weaken and destroy it. We know that if we expose the plate in the camera for a considerable time (say an hour) before a brilliantly lighted object, a faint visible image is impressed on the plate without application of the developer; therefore it is assumed the change of the silver salt under the action of light is to a metallic state. 3. A molecular change of the silver unattended by separation of the elements, such as occurs in the case of a visible image impressed with light, is supposed to be the character of the formation of the invisible image, yet such a modification of the film has taken place as to predispose it for the reception of silver when reduced by the action of the developer to a metallic state.

DEVELOPMENT.

In developing the invisible image, the agents generally employed are protosulphate of iron, the double sulphate of iron and ammonia, and pyrogallallic acid. If a solution of sulphate of iron and water be poured on to a plate sensitized with nitrate of silver, the reduction is immediate, and to retard this action an acid is added. The rapidity of action of the developer is also affected by the temperature of the atmosphere and of the developing solution—the reduction of the silver being slower at a very cold than at a very warm temperature. In portrait photography protosulphate of iron and the double sulphate of iron and ammonia are used for developing universally, of strength varying according to circumstances. The usual strength is, one ounce protosulphate of iron and one ounce acetic acid to sixteen ounces of water. This solution, after a day or two, turns yellow, and deepens in colour as it is kept, and a sediment falls to the bottom of the bottle: this can be easily filtered out. It does not appear to affect the chemical action of the developer, and though many prefer a new solution, I have failed to discover any difference.

After dipping many plates in the negative bath, it accumulates alcohol and ether from the collodion, which prevents the developer from flowing evenly over the plate, in which case a little alcohol added to the developer is sufficient to overcome the difficulty; but it is better to renovate the bath in the manner already described.

The effect of a strong developer is to reduce intensity, making the image appear thin and lacking sufficient contrast, while a too weak developer brings the image out slowly and too intensely in the high lights, leaving the shadows comparatively bare. Another effect of a developer of this character is, that the reduction set in motion by it is so slow that the shadows become fogged before the lights are sufficiently brought out; and the same effect is caused by a strong developer, because the reduction of silver is too rapid to be properly watched, so that, before the developer can be washed off, the silver has been deposited on all parts of the negative, giving the shadows a misty, veiled appearance.

The flow of developer over the plate must be rapid and

steadily, poured on from the thick edge of the film, that uppermost in the carrier (see Chapter VI.). The plate is held as explained in the manipulation of flowing with collodion. Just enough developer being poured on to cover the plate with a steady flow, none should be permitted to run off. In a moment or two after the application of the developer, the image will begin to appear. Allow the solution to remain on the plate until the high lights are nearly out, and before the deepest shadows have any delineation, as development goes on to a certain extent while the developer is being washed off.

The timing of the exposure being correct, and the lighting of the sitter being perfect, the image on the plate should come up under development in a few moments after covering the plate with developer, and continue to grow to its proper intensity without any of the agonized gymnastics so often indulged in by operators in this manipulation, and so painful to behold. The plate should be held perfectly still and straight, that none of the silver be lost from its surface. Sometimes when lighting and timing (by which is expressed the time of exposure of the plate) are not quite right, a little gentle motion may aid the development.

The effect of an under-exposure of the negative is, that the silver precipitated by the sulphate of iron does not deposit on the plate sufficiently to form a perfect image, the brightest lights alone receiving it, and the delicate lights and half-tones being perfectly void; while, with an over-exposed plate, the proper gradation is lost by extending the deposit to the shadows. So, too, with the development: if the iron solution and silver be washed off too soon, much the same effect as in an under-timed negative is seen; and over-development will make the most brilliant negative flat and uninteresting.

Quickness of eye, deftness of hand, and care are more necessary in this manipulation, perhaps, than in any other in the whole range of photography. There is here endless variety; changes of lighting necessary to suit the style, dress, or whim of the sitter; slight differences of exposure, and the manipulation of drapery, from funereal black to dazzling bridal white, all coming within the range of one day's experience, and all to be treated differently, and often (as in the case of the operator whose province is the dark room) only discovered as he develops the plate. He has to bring all his experience to bear on the instant.

A NEW METHOD OF USING PAPER IN PLACE OF GLASS FOR NEGATIVES IN DRY-PLATE PHOTOGRAPHY.

BY LEON WARNERKE.*

ALL photographers are aware that photography out of the studio, with the systems now employed, presents certain difficulties which make the process of taking a photograph anything but pleasant. Having, in my photographic excursions, experienced all these inconveniences, I adopted from time to time different improvements; and, having now arrived at a very satisfactory solution of that all-important question for every photographer engaged out of the studio, I intend to give a full description of my method of working, and illustrate it by practical demonstration.

I scarcely need discuss the question whether the wet or dry system is to be employed for landscape photography. Owing to the great perfection reached in the preparation of collodion and gelatine emulsions, my choice is made, without hesitation, in favour of the dry system.

The first obstruction encountered is the material employed at present for the support to the sensitive film. Glass, notwithstanding the last extremely important discovery of M. de la Bastie, possesses many disadvantages when used in out-door photography. 1. It is heavy. 2. It is bulky in itself, and more so from the necessity of leaving empty space between the plates to prevent contact

with the sensitive surface; and, again, from the necessity of having some kind of box for storing. 3. It is brittle, and consequently requires extra care in transport. But the drawbacks are too numerous to enumerate. They are visible to every photographer, and I hope that experiments I have to perform, while showing the superiority of my new system, will render the disadvantages of glass more salient.

My principal improvement upon the old system is the substitution of paper, cloth, or any flexible material for glass, as support for the sensitive film. In my early experiments (made some five years ago) I applied simply bromized collodion to paper of fine texture sized with starch. But when it was used without substratum, prolonged development or further intensification occasioned discolouration of the paper by the action of the pyrogallie acid, and it consequently was regarded by myself as unsuccessful. But I cannot omit to mention it on the present occasion, for the very important observation made that bromized collodion in contact with the paper is incomparably more sensitive than the same in contact with glass, gelatine india-rubber, or dammar varnish. The paper used by me was Steinbach's photographic. My experiments were made a long time before Mr. Bolton published his excellent washed emulsion process, so my collodion was made from—

Sulphuric ether...	...	...	4 ounces
Alcohol ...	...	...	4 "
Solution of bromine 1 dr. in alcohol 1 oz.	20 minims		
Suitable pyroxyline ...	...	...	40 grains
Nitrate of silver (in hot alcohol ...	80 "		

or equivalent of oxide of silver

Neither preservative nor washing was necessary.

My next step was using a gelatine substratum between the paper and bromized collodion. In that and in the former case, to avoid discolouration, the developer was free from water. After exposure, the sensitive surface was flowed with a solution of—

Pyrogallie acid ...	...	...	30 grains
Alcohol ...	...	...	1 ounce

The excess was returned to the bottle for future use, and the following solution was immediately applied—

Alcohol ...	...	...	1½ ounces
Solution of bromine 1 dr. in alcohol 1 ounce	10 minims		
Strongest ammonia ...	...	...	2 drachms

The negative, when finished, was put on the glass, immersed in hot water, and the temporary paper support peeled off. Further experiments prove that great simplification and excellence are secured by the following method.

Preparation of the Negative Film.—I take a sheet of white enamelled paper, bend all the sides to form a shallow dish, put it on a glass plate of suitable size, pour in the centre some plain collodion to which a small quantity of paraffine in alcohol was added, and return the excess, after distribution and usual rocking, to the bottle. This, when dry, will leave the paper very easily; but, to avoid this premature occurrence, lines are made with ruling pen or brush and asphalt varnish round the sheet; or, if it is to be cut, each plate is to be delineated with varnish. When this thin coating of collodion is dry, a solution of india-rubber in benzene is applied in a similar way. When dry, another coating of the following collodion is applied.

Ether ...	...	...	20 ounces
Alcohol ...	...	...	40 "
Castor oil...	...	...	1 ounce
Pyroxyline ...	...	...	1 "

After drying, another india-rubber coating, and, lastly, sensitive bromized, bromo-iodo-chloro, or any of the washed collodion emulsions, is applied. When gelatine emulsion is preferred, the last india-rubber coating is omitted. I find the film is equally good when, after first coating of the collodion and paraffine, the following solution of gelatine is applied:—

Gelatine ...	...	...	1 ounce
Sugar ...	...	...	1 drachm
Glycerine ...	...	...	½ "
Water ...	...	...	quant. suff.

* Communicated to the South London Photographic Society.

After it is dry, coatings with collodion and india-rubber follow, and lastly the sensitive emulsion.

In preparing the film, I prefer to build it from several thin coatings, instead of one of requisite thickness, because in that way I can avoid irregularities in thickness occasioned by curling of the paper. For the same reason draining of the solution is made each time from a different corner.

The prepared negative film, with its supporting paper, is cut to the desired size, interleaved with tissue paper for extra security, and preserved from light for use.

Exposure.—For large plates the film is exposed in the usual dark slide behind the glass plate. I choose the glass plate the same thickness as the ground glass in the focussing-frame, and, after reversing the last, I have the sensitive and focussing surfaces to coincide. For small plates, from 6½ by 8½ downwards, I prefer to avoid the use of the glass plate, and attach the paper with sensitive film to some rigid support. Mounting boards answer the purpose very well; but when even this inconsiderable thickness is objectionable, ferrotype plates are an excellent substitute. Negative films with supporting ferrotype plates are so thin that in my excursions last summer I was able to put twenty of these plates in every dark slide; and having with me Howard's tent, attachable to the camera stand, in three dark slides sixty negatives were

taken without necessity to repair home, or to have a plate box for those sixty plates.

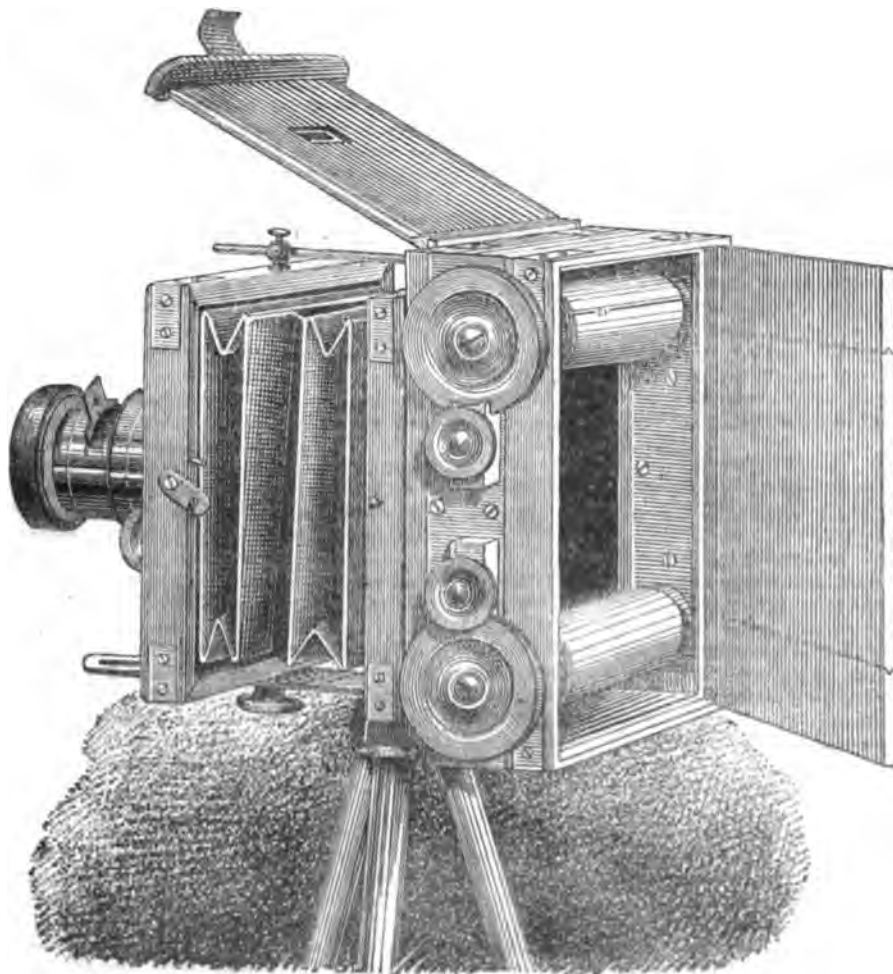
Development.—For the development, I have to detach one corner of the film with a penknife, and, holding it with two fingers, all the film can be easily detached from the supporting enamelled paper.

After this, it is attached to a glass plate of the same size by means of a few drops of water. From that moment the development of the negative is proceeded with in the manner familiar to every photographer. In fact, the film is attached so firmly to the glass plate that there is not the slightest difference in the behaviour of that and old glass plates.

After development, fixing, and washing, some blotting paper is applied to remove the last drop of water. This mode of drying—provoking shuddering in the followers of the old glass system—need not be feared with my films. The final drying—especially when gelatine is used in the formation of the supporting film—must be executed under light pressure, between blotting-paper, in a book or otherwise.

If convenient, it can be dried on the glass plate and varnished, avoiding varnishes requiring heating of the plate; but there is no necessity for varnishing, except to facilitate retouching.

In this stage I have used the process for the last two



years with invariable success, and have hundreds of negatives to testify it.

But I must confess I am subject to all the human imperfections. We are never satisfied with what we possess; and this spring, waiting for longer and brighter

summer days, and planning my new excursions, the thought of carrying in my pocket Howard's tent, and prospect of plunging my head into that tent for changing each plate after the exposure, looked to me an unbearable torture. For consolation I retired to my work room, and,

after some time, succeeded in preparing the slide which is intended to remove the last of the impedimenta in my way.

Dark Slide.—The principal components of the new dark slide (see illustration) are two rollers on which the sensitive film, with its supporting paper or without, is wound, and there is room enough for one hundred plates. A darkened glass plate is fixed in the front, in the place corresponding with focusing surface; this glass plate guides the sensitive film in the progress from one roller to the other, and secures its proper position. Each roller has a metallic head by which it can be put in motion. By means of those heads all the ribbon of sensitive film can be consecutively drawn from one roller, and, after exposure, re-wound on another roller. But to secure perfect flatness there is attached to each head a pressing screw, that arrangement permitting stretching of the film when in position.

Before the sensitive ribbon is attached to the roller it is divided into sections, corresponding with the size of plates, by black lines drawn in pencil or otherwise, and each section is numbered.

In the sliding shutter is a little window secured with orange glass and spring metallic shutter. Through the orange glass I am able to observe the black lines forming divisions between the plates and corresponding numbers. This permits me to judge of the proper position of each consecutive plate, and tells me which plate is to be exposed; and if any imperfection was observable, and which plate to avoid.

The production of negatives in the field with the aid of these improvements is a real enjoyment, because all the hard work is removed, and advantages gained over the old system are numerous.

Volume and weight of plates and apparatus are diminished

Chance of breakage there is none; chance of abrading the sensitive surface is diminished. I ascribe to the flexibility of the support the greater amount of resistance to rough treatment my film offers.

There is no blurring possible. In application to the paporamic camera, what can offer facility similar to the new film? All costly cylindrical plates and special printing frames are useless; the sensitive film can take any shape in the dark slide, but will be flat in the printing frame.

For printing in carbon, and for all processes requiring reversed negatives, the film negative is ready without preparation. For printing stereoscopic negatives transposition is easy.

For storing negatives, no room, no boxes, or shelves are necessary. Film negatives are not destroyed by atmospheric influences.

Lastly, who can with the glass system, while going to distant lands, dream of taking one thousand plates for his long excursion? But with my film that number, or one still larger, would not increase the weight of the traveller's luggage more than by a few ounces, and by few inches the volume.

When I look to the future the circle of the beneficial effect still widens.

Pliability of the sensitive film can alter optical conditions of our apparatus. Our lenses will be smaller. Definition more perfect. Distortion, spherical aberration, and other optical imperfections diminished. Aperture increased, and consequently exposure shortened.

I conclude with another less important improvement. I do not like the black cloth we use to cover our head when focussing. It gives a mysterious appearance to the operator, and increases the curiosity of the passers-by. Very often it conspires with the wind, without any respect for the head-dress of the operator, or stability of the camera.

In my apparatus I substituted a looking-glass inclined 45° to the ground glass. The image appears in right position, is much brighter, and when shut the frame containing the mirror offers a protection to the ground glass, taking infinitely less room than the black cloth. -

PAPER ON ASTRONOMICAL PHOTOGRAPHY.

BY O. D. CHAPMAN.*

PHOTOGRAPHY, as applied to solar and lunar work, is very important, but the principal advantage derived from its application to astronomy is in star work, as it greatly facilitates determining the direction and amount of motion of the stars.

All other methods practised require experienced observers and fair nights, one demanding large salaries, the other occurring whenever the conditions are favourable, and that being less than one-half of the time. By the application of photography a cheaper class of labour can be employed. A photographer may be obtained for a few hours on fair nights, during which time he can make negatives enough of groups to keep one person employed for months in measuring, which can be done in the daylight by operatives at small salaries, and without loss of time to the principal.

There was a question, however, as to whether the photographs could be relied upon for measures of precision. Does the film, during the manipulation and drying after exposure, remain absolutely fixed in its position?

The subject engaged Mr. Rutherford's serious attention for some time. The photographing and measuring of stars of known distances apart convinced him that the film was perfectly reliable. Afterward, however, there being some doubt thrown upon the subject by Mr. Paschen, Mr. Rutherford instituted another series of trials—which I executed—to ascertain, if possible, the facts in the case. These satisfied us that, with properly albumenized plates, the film can be relied upon for work requiring great precision.

The albumenizing is a matter of the greatest importance, for if the albumen is not in the proper condition, it not only does not hold the film, but is a fruitful source of trouble to the bath. My experience has led me to the conclusion that if we could get an albumen solution in which the albumen would be entirely coagulated by a forty-grain silver bath, then the albumen would do no harm. But as only a portion of the albumen is coagulated, there remains a part which is soluble in the silver solution. This is easily demonstrated by dipping three or four albumenized plates, without being coated with collodion, into a perfectly clear silver bath, then standing them in the sunlight for awhile. The above is true with albumen in its best fresh condition, and it is still worse when the albumen has been kept for a time, no matter under what circumstances. Everything which has the property of keeping the albumen makes it more deleterious to the silver, for there is nothing that I am acquainted with which is used that does not have either the tendency to coagulate or dissolve it. If we use that which has a tendency to coagulate in quantities sufficient, a portion of it will be coagulated, and it is that part which is most desirable to retain; for the greater the quantity which will be coagulated in proportion to that which will not be, the better. If we use ammonia, or the like, which has a tendency to dissolve the albumen, then in time, in proportion to the amount of ammonia used, the albumen will be changed to a condition in which the silver will not coagulate it. In this condition it is worse than nothing. A small amount of ammonia may be used (say one drop to the ounce of albumen solution) to keep it for a short time where a person is using only small quantities, but its best condition is when freshly made and alone; then one ounce of albumen to thirty of water is sufficient. My practice, in albumenizing plates, is to wash one and set it up between two nails, with one corner down, while I wash another and set it up in like manner. The first is then albumenized and set upon clean blotting-paper, on one corner, with the albumen side toward the wall. The third plate is then washed and set up to drain, and the second is albumenized. By this method the albumen is not diluted, as the surplus water drains off, leaving the surface wet enough to allow the albumen to flow readily, at the same time the edges of the plate have dried sufficiently to prevent the albumen from flowing over on the back. The albumen may be used over several times if not kept too long.

* Read before the Photographic Section of the American Association.

The Photographic News.

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M. LAMBERT'S SYSTEMS OF ENLARGEMENT AND CARBON PRINTING.

THE name of Mons. Lambert as a photographer, not only of rare ability, but of singular inventive ingenuity, has already been brought under the attention of our readers. Last autumn we described the operations in the method of enlargement known as *Lambertype*, which we had witnessed at the inventor's studio in Paris, and we subsequently sent to the Photographic Exhibition a couple of examples of the results produced, which won golden opinions from all who examined them. Mons. Lambert is now in this country for the purpose of introducing not only the *Lambertype* system of enlargement, but also, under the name of *Chromotype*, a modified system of carbon printing, combining great simplicity with charming perfection of result. The special object of Mons. Lambert's visit to this country, which will be continued during the next month or two, is to give practical tuition to his licensees; and it is scarcely too much to say that—as he is one of the most skilful manipulators we have ever had the pleasure of witnessing, and his appliances are replete with ingenious contrivances not necessarily associated with his system, but of great value in general work—a day spent in watching his operations must prove to many a boon of inestimable value educationally, forming no light consideration in the contract for a license.

In relation to the *Lambertype* method of enlargement, it is not necessary to add much to the details we published some months ago, beyond remarking that all the additional examples we see, whether produced by the inventor or his pupils, only confirm the high opinion of the method and its results we have already expressed. We may again say that many points of the method may have been partially anticipated. The use, for instance, of a transparent paper for receiving the retouching of the enlarged negative was described by Mr. Croughton in our pages a year or two ago. But it is in the extension and completion of this and other methods, and in the combination of several of them, forming practically a *system of working*, producing results of rare excellence with the expenditure of comparatively little labour, that the claims of *Lambertype* consist. By the intervention of the various operations and appliances involved, Mons. Lambert seems to be practically independent of the quality or character of the original small negative. Weak negatives, hard negatives, dirty negatives, cracked negatives, even poor small prints, are all alike made to yield an enlarged negative, from which fine prints scarcely requiring a touch to render them perfect may be produced.

The process termed "*Chromotype*" is, as we have said, a modified system of carbon printing, yielding prints of

rare delicacy and brilliancy. We can scarcely undertake to state the precise claims of the patent, as we have not seen the specification. In many respects it is allied to Mr. J. R. Johnson's method, and in virtue of this fact, alliance with the Autotype Company, rather than antagonism, has been established. The claims made for the *chromotype* process are, as compared with the ordinary method of carbon printing, greater simplicity in manipulation, greater sensitiveness in the tissue, and higher finish in the result. That the tissue is very sensitive, very easily developed, and the results very excellent, we have seen demonstrated. But of the relative superiority in these points we offer no opinion, not having seen comparative trials. The tissue can be manufactured at a cheaper rate, we understand, than ordinary tissue, and will be manufactured and supplied by the Autotype Company, but only to Mons. Lambert's licensees. The same marvellous ingenuity displayed in the *Lambertype* process pervades the operations in the *chromotype* process. The registering printing frames, by which are effected masking, double printing, &c., of the carbon prints, so that tinted margins, name, address, or other design may be produced on the print, are singularly ingenious, simple, cheap, and efficient. The tinting of the prints where required, the finishing with an enamel surface, are not less simple and efficient. So much more can be learned by a single sight of operations and results than be conveyed by mere description, that we strongly commend all in any degree interested in the matter to pay a visit to Mons. Lambert at his temporary English studio.

"NONPAREIL" PHOTOGRAPHS.

THE new metal plate, invented in America to supersede opal glass, and designated "*Nonpareil*" or "*Alba*" plates, appear to be exciting some interest amongst our readers, several of whom speak highly of the results. The editor of the *Photographisches Archiv* gives his experience with the plates, in which the manipulation appears to be slightly different from that we adopted, and which with us answered well. It may, however, be interesting to repeat his remarks.

The plates are in the first place dipped in a bath of alcohol until the film is quite impregnated with it, and in this way the formation of air-bubbles is prevented. Collodio-chloride of silver is then poured upon the white surface, and allowed to dry spontaneously.

The printing is carried rather deeper than the finished picture is to be. If the film is to be fumed with ammonia—an operation which is by no means necessary—the fuming should not occupy more than from one to three minutes.

After the printing is completed, the plate is taken from the frame and rinsed in the first place with water, and then put into a weak solution of common salt, until the image assumes a light red tint all over it. It is then taken out and toned for a very short time in a weak alkaline gold bath, after which the plate is allowed to sojourn for ten minutes in a saturated solution of common salt. Finally the print upon the plate is washed thoroughly in water, and dried under the influence of slight warmth.

Very agreeable tones may be secured with the sulphocyanide of gold bath; alkaline toning baths do not give the most favourable results with collodio-chloride prints.

One of our correspondents sends us illustrations of a curious experience, of which he, however, gives us insufficient details. It appears that after printing, he immersed the plates in a weak bath of acetic acid and water previous to toning, which appears to have dissolved not the image, but the white basis. All the details are manifest, but rather in varied texture upon the black surface, than in gradations of black upon white. We shall be glad to learn the experiences of our readers as to whether such an abnormal result has occurred in other hands.

PAPER NEGATIVES.

BY WM. BROOKS.

As this subject of late has been creating a little interest, I venture to give my experiences in the matter, trusting they may be of service to those who wish for a good, simple, and reliable process for enlarging and giving results of a very high character. It is very strange that Mr. Valentine Blanchard and myself should have been working a process which we both considered original—as I believe it was with us individually—and it was peculiar that, on seeing Mr. Blanchard after he read his very interesting paper at the London Photographic Society, that in a little conversation we had on the subject, we found that we had both been working it out in detail in exactly the same manner in every respect. This will show how two minds may at the same time be engaged upon the same subject without the slightest idea of each other's path of investigation. Instance, again, Mr. J. Spiller with his nitro-sulphur light, and a French gentleman (I forget his name at the present moment), a member of one of the French Photographic Societies; but both, in this instance, brought their discoveries before the societies in England and France at the same time.

I will state how I first came to work in this direction. I reasoned in this way. I found, as every photographer has, that masks made with ordinary sensitized paper, after being blackened by the action of light, made the best opaque paper masks, and kept the part they shielded white most effectually, no matter how long exposed even in direct sunlight; and, on the other hand, I found that if paper is left white, instead of being blackened by light, I could print through it, and obtain the most intense blacks suitable for the shadows, but with the half-tones I found it most difficult at first, owing to the grain of the paper showing, which in small work is objectionable, though in large work it does not matter. I consider it an improvement, rather than a defect, giving a kind of stipple, which gives a peculiar softness when examined at a little distance; whereas in small work it spoils the effect, which is easily seen. At last I have managed to overcome the difficulty so as to either print proofs with or without it at pleasure, which I think is a step in advance. I have not tried this class of negative for carbon printing, but should think they are most admirably suited for it, being able to print from either side of the negative, so as to do away with the double transfer, which is a great boon.

The class of negative does not seem to matter from which we obtain the enlarged negative, providing that it is not an under-exposed one. A transparency is made in the ordinary way in the camera, taking care that the high lights of the transparency must be bare glass, for if they have the slightest deposit or veil on them, a good and perfect result must not be expected; and at the same time the deepest shadows must be perfectly opaque, for if they are in any way transparent or non-actinic in colour, it will render the proof-prints flat, similar to an over-exposed or fogged negative.

For the transparency I use a collodion of a high colour, and an acid bath if small negatives are to be produced—that is, from quarter-plate up to whole-plate or 10 by 8.

I prefer a pyrogalllic acid developer, viz.:—

Pyro	...	...	...	...	1 dr.
Citric acid	...	...	...	...	20 gr.
Glacial acetic acid	...	...	...	...	1 dr.
Water	...	...	...	...	20 oz.
Methylated alcohol	...	...	...	quant. suf.	

With this developer the exposure is about six times as long as for iron development. For iron developer I generally use—

Ferri-protosulph.	...	...	...	10 gr.
Glacial acetic acid	...	...	...	15 min.
Water	...	...	...	1 oz.
Alcohol	..	...	...	quant. suf.

With the iron developer, if the light is weak, I sometimes find it difficult to get sufficient intensity in the shadows of the transparency. If, after fixing in the usual way, I find a slight degree more of intensity is required, I flow over it the following (it is an old formula, and very useful if used with care):—To a saturated solution of bichloride of mercury add a 10-grain solution of iodide of potassium in 1 ounce of water. A red precipitate will be formed. The iodide solution must be added until the red precipitate is re-dissolved, or nearly so, and it is then ready for use after filtering.

The film, after it has been wetted again (if it has been dried), is to be flooded with the above, which increases the intensity very much. If only a slight increase of intensity is needed, about half-a-drachm of the above to one ounce of water will be sufficient, but care must be taken not to carry it too far. At first it changes the colour of the film to an olive green, which is the colour required; if carried farther, it gives a canary yellow, which is useless. Or, instead of the mercury intensifier, the persulphate of uranium may be used with advantage, as only one or two printings may be required from the transparency. I am quite aware of the drawbacks of this intensifier—of its gaining intensity on its being exposed to the light. It is sometimes an advantage here, if the transparency is not dense enough, to give a good paper negative in the first printing.

Having obtained a suitable transparency perfect in every point, the next step is to print the negative, which is done in the ordinary way in the printing-frame. I prefer thin Saxe paper highly salted (say with twelve grains of chloride of ammonium), and excited on a bath of not less than sixty or eighty grains of silver to the ounce. It must be printed very deep. If the intensity is sufficient, and everything correct, the shadows in the paper negative will appear as white lines; the high lights, or intense parts of the negative, perfectly opaque.

After printing, I like to tone slightly with gold in the ordinary way, and fix as usual. If only a print or two be required from the negative, it need not be waxed. A negative thus obtained can be used to print from on either side, as required. Waxing reduces the intensity very much; if a number of prints are required, waxing is indispensable. I think this part of the process is not understood by photographers. In all instructions I have seen printed, great stress seems to be given to ironing the paper, after waxing, between blotting-paper, to take up the superfluous wax. Such a method I think very wrong—at least, I find it so, for it draws all the wax out of the paper very unevenly, and leaves the grain, which is required to be seen as little as possible.

I proceed in this way. I take a sheet of glass, perfectly clean, on which I lay the paper negative, albumenized side down. I use, for this purpose, an instrument like those used by chemists for spreading plasters or blisters, with a wooden handle; they are better than the ordinary flat iron. I use two: one is heating while the other is in use (either heat in the flame of a spirit lamp, or a Bunsen burner); when well hot, I take a lump of white wax or waxing composition, which I use composed of—

Japan wax	...	...	...	3 parts
Solid paraffin	...	...	...	1 part

melted together; hold it against the hot iron to melt it, and let it drop all over the paper. When there is sufficient, I commence to spread it well about with the hot iron. The paper will become perfectly saturated. Spread very evenly by means of the handy tool described. No ironing between blotting-paper is needed. I find this the most effectual way of rendering paper transparent. Another system I find very excellent—some may prefer it: lay the negative down as before, and, with hog-hair varnish brush, give it a good coat of ordinary negative varnish, and hang up to dry; it can be made perfectly transparent with one coat; do not attempt a second,

thinking to improve matters, after it is once dry, or it will become patchy, so as to render the negative perfectly useless.

A word respecting white wax. I find it very difficult to get it unadulterated. Have paid as high as five shillings per pound for it, which comes expensive. The Japan wax I find answers every purpose; it has a slight colour in the mass, but that does not matter, as it will not be seen when in the negative. It is a little softer than white wax, but, with the paraffin added to temper it, it answers admirably. This Japan wax costs from eightpence to tenpence per pound—a vast difference in price compared with the white, and equally as good for the purpose. Paraffin alone I find too brittle.

If it is only required to reproduce negatives the same size as the original, I print the transparency in carbon, using that known and sold by the Autotype Company as the dense tissue. The transparency is developed on glass, and the negative afterwards obtained in the same way on paper as the enlarged negatives before described. Having obtained the negative, and everything carried out successfully, I quite agree with Mr. Blanchard, that paper negatives seem to possess a charm peculiar to themselves, not to be seen in negatives on glass.

The matter of printing needs no remarks, it being the same as from glass negatives. In the commencement of these notes I said I found a difficulty at times to do away with the texture of the paper from printing out in the half-tones. I get over that difficulty in this way, which not only answers the purpose of subduing the texture, but answers another very important purpose which will be seen further on. If the texture is offensive, do not print the paper negative quite so dense as given before; print a little lighter; this we will call No. 1. Print a second, which we will call No. 2, but this must be printed very light; when dry, take a glass plate the size of the negative, lay both together, getting both images to coincide, which can be seen by transmitted light; trim them, whilst they are both together, to the size of the glass; wax No. 1, and lay it aside; wet No. 2, to cause it to expand; blot off between blotting-paper; run thin glue all round the edge for about a quarter of an inch; lay the glass down carefully on it, leaving an equal margin all round; when dry it will be strained perfectly tight; trim off the edges. Now attach No. 1 to the opposite side of the glass, along one edge only, with india-rubber paste, which can be easily stripped off if required; it will then give a print almost without any texture. In printing through the two, No. 2 may be coated with castor oil dissolved in twice its bulk of methylated alcohol, taking care not to let any of it touch No. 1 on the other side. I must not forget to mention that No. 2 will give intensity or softness according to the depth it is printed.

I think I have given in detail sufficient instruction to enable any operator of ordinary ability to produce good results. I have been several years working this process out, also the subject of the paper read by me at the last meeting of the South London Photographic Society at the Society of Arts, the subjects of both being peculiarly linked together; and therefore should advise the readers of this to also read the one part referred to, and I feel quite convinced that it will be quite a new power in the hands of those who have never seen its capabilities.

CONVICTION OF "SPIRIT PHOTOGRAPHERS" IN PARIS.

THE "Own Correspondent" of the *Daily News* in Paris gives the following details. He says:—

"A strange trial has taken place before the Correctional Tribunal of Paris, and it has resulted in the conviction of certain 'spirit photographers' for swindling. Buguet, a photographer, of No. 5, Boulevard Montmartre, allied

himself with M. Leymarie, the editor of the *Revue Spirite* (who wrote about him, and published fac-similes of his portraits), and with an American named Firman, from whom he learned the art of persuading people that he could, if they only willed strong enough, conjure up and photograph a likeness of any deceased relation or friend. For a long time the firm did a large business. Twenty francs was the ordinary fee, but many wealthy people voluntarily paid 2,000, 3,000, and even 4,000 francs. Never was fraud more clearly proved. The operator's spirit-box was produced in court; it contained hundreds of portraits of men, women, boys, and girls, of all ages. When customers came desiring spirit portraits, a young lady, who acted as cashier, adroitly engaged them in conversation in the waiting room, and generally contrived to find some indications of the physiognomy of the person whom it was desired to evoke. Then one of the numerous heads was selected, stuck upon a doll dressed up in muslin, and a hazy portrait of a spirit was produced from it. Buguet guarded himself by saying he could never guarantee a likeness, because much depended on the strength of faith of the applicant, and, moreover, spirits were very capricious, and sometimes when you called for one, another would come; but in very many instances the force of imagination was so strong that his dupes believed they saw the portraits of their relations. They burst into tears, fell upon their knees, kissed the photographs, and were profuse in expressions of gratitude to the professor, as well as lavish of gifts to him.

"Notwithstanding the palpable exposure of the imposture in open court, a host of respectable witnesses, including a Russian Marquis, the Comte de Bullet, Mr. Sullivan, formerly United States Minister at Madrid, two French colonels, and several ladies, appeared for the prisoners, and, undismayed by the sarcasms of the presiding judge, protested that they really had seen unmistakable portraits of deceased relatives. The eminent council for the defence, M. Lachaud, spoke for two hours, and alluded to Moses, Isaiah, Tertullian, and other authorities on spirits. The Court, however, thought the charge fully proved, and sentenced Buguet and Leymarie to one year's imprisonment, and Firman to six months'. It is curious that the prosecution was not instituted on the complaint of any customer, but spontaneously by the police for reasons not explained."

A leader in the same journal, commenting on the case, remarks that "such photographs are by no means rare, either in England or America. In Mr. Alfred Wallace's apology for spiritualism he maintains that it is only rational to expect that the shades of the dead, if present in a room, can be photographed there, and that experience answers to natural expectation. In America an artist of this sepulchral class has been tried and acquitted on evidence which went, on the whole, to prove that he did not get the money of his clients on false pretences. M. Buguet has been less fortunate, as he is, perhaps, less honest. His stock-in-trade—a very large number of miscellaneous photographs, and a lay figure, used 'with intent to deceive'—were displayed in court; but his patrons declined to be undeceived. Buguet, they said, may have been tempted to cheat in moments of failure, but he did not always cheat. This defence is, of course, impregnable, for people capable of trusting a confessed imposter are far beyond argument. The accused and the judge were sceptical; the witnesses, including Madame Kardec, the widow of the modern high priest of French necromancy, were mostly on the side of the dubious angels. The trial is an instructive one, and appears to confirm the remark of the philosopher that 'stories of spiritualism show how very few people can be believed on their oaths.' That people should be anxious to go on believing is only natural when they have given two thousand francs and a musical instrument to the deserving photographer of the quick and the dead. But persons who have not yet

invested time and capital in the unseen world will probably be deterred by this trial from doing so; and every one should rejoice in the result, which, from one point of view, exposes a hateful superstition, and, from another, weeds an unworthy pretender out of the ranks of mediums."

HINTS ON RETOUCHING.

[OUR Chicago contemporary continues the excellent remarks on retouching from which we have already quoted.—ED.]

FACIAL EXPRESSIONS.—Before leaving the consideration of the face in a negative, it becomes necessary to speak of faulty expressions, as many otherwise very good negatives are discarded because of some fault of this nature; and where the fault is not too great, it is quite possible to remedy it in retouching.

1. *Too Serious.*—In such an expression the corners of the mouth are drawn downward, with dark shadows continuing the expression towards the chin; the lines upon each side of the nose are almost perpendicularly straight; and the shadow just below the lower lip may encroach too far upon the chin. To remedy these defects, every line about the mouth that assists this sombre expression must be curved backward, by working upon their lower edges. If any are found to be so strongly marked as not to succumb to this treatment, they must be gradually shortened, but never entirely obliterated. The partition line between the lips must be curved upward, making it seem lower instead of upper lip that occupies the shadow at the extreme corners.

2. *Scowl.*—Should a scowl accompany this sombre expression, the eyebrows are drawn too near the eyes and each other, causing too much shadow under and between them; a dark line running horizontally across the forehead contrasts disagreeably with a bright light just above them. In youth, whatever of line or shadow appears between the eyebrows must not be allowed to remain; but in an aged face, leave only that that is habitual to it. The shadow under the brows must be lightened, and the eyebrows themselves shortened at their inner angle, and raised as much as possible. The light just above the eyebrows should seldom be increased, as by contrast it usually appears too bright in these cases. The shadow running across the forehead must be softened into this light, and only so much of it allowed to remain as will correctly denote the natural curve of the forehead.

3. *A Smile*—if so great as to be objectionable—requires the exact opposite of the above treatment. Curving every muscle about the mouth downward, by working off the upper edge of the shadows which denote them; shortening the partition line of the lips; making the most of any slight shadow extending from the corners of the mouth toward the chin.

I need scarcely add that these manipulations require great care, and to the inexperienced I would suggest that when an expression is to be corrected, a paper be held, in different positions, over the offending member, to enable them to judge more correctly of the locality and extent of the fault to be corrected.

THE FEATURES.—Besides these facial expressions, and frequently when none of the above faults exist, some other member of the face may need our attention, as:—

1. *The Eyes.*—It occasionally happens, in a three-quarter view of the face, that the eye upon the light side of the face is well defined and perfect, while that upon the shaded and further side has a dark, unilluminated shadow upon its inner angle, which, added to a bright reflected light within the opposite side of the iris, gives to the eye a weird and sunken look. It is usually sufficient illumination of the

shadow to increase the opacity of the white of the eye, making it brightest where it meets the iris, allowing it to gradually be shaded back toward the corner nearest the nose; also, to better define the upper and lower lids, allowing quite a bright light where they both join together. The negative will usually suggest the correct location of these points. Should the print not show the direct light of this shaded eye, its brightness may be increased in the negative, but not its size. The reflected light cannot be remedied in the negative, but it can be made to occupy a smaller space in the finished print, which is usually all that is required to perfect the expression. A dimness of the pupil of the eye is sometimes met with, usually caused by bad lighting. There is a way to remedy this in the negative, which I scarcely dare give, because of its frequent abuse—that of taking out that portion of the eye with the point of a fine needle. Also is this sometimes used to better denote the shadows about the lids. In no case would I recommend this, unless a facsimile negative can first be experimented upon, and a print of it obtained. Skillfully and properly done, it saves much labour, but a far safer plan is to remedy the defect in the finished print.

2. *The Nose.*—As a rule, this member will require upon the tip, seemingly the brightest point of light the face contains. Should it be of ugly shape—either crooked, pug, or lengthy—we are fully justified in softening or removing the defect. As this is quite an inexpressive feature, a change of this kind does not alter the character of the face.

3. *The Cheeks.*—Every muscle that aids in giving character to the face must be inflexibly preserved. A careless retoucher will invariably forget this in his zeal to produce smoothness. As the cheeks show more of these than any other portion of the face, great care must be used to preserve their exact form. The one least defined, and easiest removed, lies just back from the mouth and below the depression under the cheek bone. In a Rembrandt effect, particularly, does it require care to preserve this.

Hollow cheeks are often made to assume a plump, youthful appearance in retouching. It is a mistake, and should never be done. All the changing that a good negative requires is that which would necessarily be done in a careful smoothing up of them. Of course the shadows of a negative may be so dark as to give to the cheeks an unnatural hollowiness, in which case only such bringing out of them is admissible as will give their natural look. Should the face be turned so as to show this defect sharply against the background (which a good operator will usually avoid), the most that we can do is to soften the outline just where this hollow occurs, leaving the upper and lower portion of the cheek as sharp as originally seen.

In each of the above cases it is best to avoid making the light upon the upper portion of the cheek any brighter than in the untouched negative.

4. *The Chin.*—The less we have to do with the modelling of this feature the better.

5. *The Neck.*—The same class of work that the face requires will usually be needed upon the neck, with this difference: if it is an aged subject we are considering, most of the wrinkles upon the neck can be dispensed with, only retaining enough to compare favourably with the face. The general form, however, must not be sacrificed in the least. If a long dark shadow is cast upon the neck by an earring, it should be almost entirely worked out.

6. *The Ear.*—It is rarely the pencil needs to touch this member, and if it becomes a necessity, the light upon it must not be increased if it already contains sufficient, nor in all things the ear should be subordinate to the face. However, should the ear appear within a Rembrandt shadow, the light upon it will sometimes need to be increased, to give sufficient detail to that portion of the shadow.

Correspondence.

THE PROPERTIES OF WET GUN-COTTON.

DEAR SIR,—Mr. Spiller calls attention "to a slight error in your account of the recent guncotton explosion at Woolwich, wherein it is stated that moist guncotton cannot be exploded by means of a detonating fuse." If the account did lack clearness, I do not see that Mr. Spiller has improved matters. A detonating fuse, which contains about 20 grains of fulminate powder, and which readily detonates dry guncotton, will not explode guncotton in a wet state, containing (say) thirty per cent. of water; the only way in which a detonating fuse can be made to explode a charge of this kind is, as I stated, to employ an intermedium of dry guncotton. When the guncotton is only slightly damp, however, then, as Mr. Spiller remarks, it is possible to effect its detonation by using a comparatively heavy fulminate charge, 13 grammes or 200 grains or ten times as much as a fuse contains; and although such a trial has never been made, there might, I dare say, be a possibility even of exploding wet guncotton with thirty per cent. of water in it, if you used half a pound or so of dry fulminate, and pressed it well home. But who will volunteer to make the experiment?—Faithfully yours,

YOUR REPORTER.

LAMBERTYPE AND CHROMOTYPE.

SIR,—The attention of photographers will probably be arrested, and their curiosity excited, by the advertisements of the above processes, and although you have described one of them, and will probably call attention to the other, yet it may interest some to read the impression produced on the mind of an old professional photographer after seeing the demonstration of both of the processes.

One day last week I visited M. Lambert, in company with Mr. Spencer, of the Autotype Co., Mr. J. T. Taylor, and my son, Mr. Alfred Hughes. After examining a number of prints of the highest excellence, some produced in silver and others in carbon, that varied from carte to nearly life-size, we were shown the most important part of the enlarging process. A carte portrait of a lady, the original negative of which was broken, was lent by Mr. Taylor. From this a small negative was obtained by the ordinary wet process, and showing the usual coarseness by copying the texture of the albumenized paper. An enlarged transparency from this negative was next produced by the usual wet collodion process. The enlarged head was about two-thirds life-size, and it was made on a plate about 18 by 15. From this a carbon negative was made by contact printing. The ordinary carbon tissue was not employed, but a special one devised by M. Lambert. This carbon negative was very thin, and of a bad printing colour, but by a solution of permanganate of potash, to which ammonia and sugar were added, the negative was changed to a rich olive colour. The negative was then covered both back and front with a very fine translucent kind of tracing paper called *papier minérale*. On the back of the negative M. Lambert worked with blacklead powder, using a leather stump, on the face and all the light parts of the negative, thereby increasing the density in all those parts, and also softening the coarse texture. On the front of the negative he worked also, but more carefully, using a finer powder and a more delicate stump. Finally, a blacklead pencil was used to give the positive high lights on the face and the white lace. All this work was done in a "touching desk," such as employed for ordinary retouching.

The *papier minérale* is an admirable material for receiving the blacklead. The ultimate effect produced by but very little work was a negative capable of producing prints in which all coarseness of texture was entirely removed. A silver print was next made from this negative, which, without a touch being required upon it, was perfect in delicacy, softness, and vigour, and giving no indication whatever of

having been produced from a carte print. I should mention that the plain dark background of the original was considerably extended in the enlarged copy, without any evidence in the final print of any joining of the added parts. The demonstration was declared by the party to be a complete success. Although the method here described was the one adopted in this instance, M. Lambert explained that it is not the one he prefers, and it is only used when he requires duplicate enlarged negatives, as he did in this instance, that he has recourse to it. His ordinary method is to make a carbon transparency by contact printing from the original negative, and from this small carbon transparency he makes an enlarged collodion negative by wet collodion. By this means he says he secures an enlarged negative which requires less work upon it in its final stages.

On the succeeding day, my son and I visited M. Lambert again, and the rest of his ingenious methods were explained and demonstrated. They consisted in further showing how backgrounds may be altered, removed, or fresh ones substituted, without showing any joins, or requiring any work on the final print. He also showed his method of reproducing negatives so that while all the good points of the original are retained, such faults as over- or under-exposure may be amended, if not entirely removed; as also the removal of marks, stains, cracks, or other defects, so that the new negatives should be better than the original ones. Some other ingenious expedients, or "dodges," if you will, were explained and illustrated. Under the term "Lambertype" appears to be comprised all the above methods of changing, enlarging, adding to, or taking from the original negative, so that in the final negative shall be comprised all that is desired, without requiring any work on the ultimate print. "Lambertype" is therefore a general term for a number of useful, and indeed valuable methods, that have been brought together by M. Lambert for increasing the value of negatives; many of them are not new, but they are novel in their application, while others really belong to himself, so far as my knowledge goes.

"Lambertype" may therefore stand for improved negative work, and is quite independent of any method of printing that may be adopted. "Chromotype," on the other hand, has nothing to do with the negative; it is a modified form of carbon printing that cannot be worked without coming into collision with the Autotype Co. The two parties have therefore made arrangements together, so that the special tissue can be obtained from the Autotype Co.

I have had considerable experience with carbon as a substitute for silver printing, and I am much pleased with M. Lambert's modification of the process, and also with his ingenious printing press and photometer. They will all help to make permanent printing more easy and more popular.

There was also shown to us, in connection with the chromotype, an easy way of colouring these carbon prints, whereby the apparent work of hours is done in as many minutes. The results, though not calculated to compete with good miniature work, are better than the common run of low-priced coloured work, with the further advantage that it is hardly possible to lose the likeness.

M. Lambert is evidently a very able and skilful photographer. He is full of ingenious appliances, and, as his improvements are chiefly based on the common method of working, one is able immediately to appreciate them. But writing and speaking, well enough as they are in their way, are as nothing compared with seeing a thing done by a clever man.—Yours &c.,

JAMES HUGHES.

N.B.—It is right to mention that, excepting the chromotype printing presses and the photometer, no additional apparatus is required than is found in the ordinary photographic studio. The same lens that is used to produce the carte or cabinet portrait may be employed for making the enlargement. Almost every dark-room may be used for the

enlarging camera. If any one is contented with silver printing, there is no need to depart from it, for nearly all the improvements comprised in the term "Lambertype" may be utilised without deserting the old friend silver.

SIR,—It would be both useful and interesting if M. Lambert would be so good as to inform photographers, through your columns, what he claims as novel in his patent for enlarging.

He can scarcely claim novelty for the application of paper or other material to the back or front of negatives, or the working thereon with crayon, pencil, or pigment. All this has been in daily use for years past.

I find amongst photographers much doubt on the matter, and a desire to have early and complete information. Valuable novelties are readily accepted, never so promptly as now; but strong objection would be made to restrictions by patent of what has hitherto been free.—I am, respectfully,

SAMUEL FAY.

URANIUM IN PHOTOGRAPHY.

SIR,—I have been requested by several correspondents to address you a few remarks on a paper read before the South London Photographic Society by Mr. Werge. It is, however, so full of errors, and so valueless as a guide to work, that I must content myself with pointing out one important error, and one important omission, as to go in detail through the errors and omissions would occupy too much of your space.

Mr. Werge says:—"It is useless to add uranium to the printing bath with the hope of obtaining any beneficial results, and I think that fact has been sufficiently proved by the unenviable soubriquet of worthless type having been bestowed on the Wothlytype process."

I am surprised that in a paper read before a scientific society Mr. Werge should betray his ignorance of the fact that the Wothlytype process, as worked in England, was a method of printing on *collodion*, and not by means of a printing bath at all. Of what value can statements be, founded on such absolute ignorance of what has been done in photographic work?

The omission to which I allude above is, that nitrate of uranium added to a highly sensitive emulsion for negative purposes enables it to be kept indefinitely. I am now using the ends of a bottle of Chambers and Co.'s uranium emulsion five months old, and still in perfect order, the latter quality being due entirely to the addition of nitrate of uranium.

Mr. Werge's paper is merely a record of his own ideas as to uranium, the value of which may be gauged by his apparent ignorance of the way in which that salt was used in the Wothlytype process. Talking of that process, I may say that the most artistic photographic prints I ever saw were produced by it, and that of a very large number of Wothlytype prints I have had since 1864 not one has faded in any degree, which I cannot say of some silver prints of the same age.

I am glad you have also pointed out errors and omissions in Mr. Werge's paper, and have given testimony to the value of Wothlytype by saying, "Certainly some of the finest prints we have ever seen were by that method of printing."—Yours, &c.,

H. STUART WORTLEY.

SOUTH VERSUS NORTH DEVONSHIRE SCENERY, ETC.

DEAR SIR,—Your Devonshire correspondents, in recommending the Northern portion of their beautiful county, seem to have utterly ignored the Southern, where I think there is ample work for the photographic tourist. I can speak from experience, having but just returned from there after a three months' stay in search of health, and having managed to find subjects for close on a hundred negatives, taken with the collodio-bromide emulsion. For

variety of scenery I think no place could beat, though it might equal, it. Suppose the tourist to take up his quarters for a time at Torquay, which, by the way, although one of the most fashionable, and consequently expensive, places during the non-photographic season, is in the summer (being entirely deserted by its "habitués") perhaps as cheap a watering place as could be found: within a few miles he will find the most romantic and varied of rocky coast scenery, and by going the same distance inland the most charming artistic old cottages and lane bits he could desire to plant his camera before. The Dart, from its mouth to Totnes, affords a great variety of scenery, and the old town of Dartmouth itself many quaint specimens of old architecture. The church has one of the finest screens to be met with, also a fine pulpit; but although I wrote a polite note to the rector of St. Saviours, asking permission to photograph the same as an illustration to a county guide book, he refused, on the grounds that good photographs had already been taken, and that a new set were shortly to be published. I afterwards saw a set of interior views taken by his own photographer, from the sales of which I presume he will derive his commission, having doubtless an eye to business. I doubt much whether his fancied power was legal, especially as the churchwarden said that I *should* take it, and that he would give me every assistance. Not wishing to add to a strife which I saw was likely to be extended, I let the matter drop, but I mention the circumstance as of interest to photographers generally, and as being the first instance in which I have ever heard of such a refusal. At Brent, Ivy-bridge, Lustleigh, Moreton and Chagford, many days may be well filled up, and in proof of the great plethora of bits for the photographer I enclose you three views, all taken without moving the camera more than a few feet: the old mill at Holy Street (which all photographers must know, from Bedford's celebrated view of the same) forming the centre, the little fall being on the right of the stream on the left. Such a combination does not often present itself.

I have no doubt from the views that I have seen of North Devon—viz., Linnmouth, Linton, Ilfracombe, &c.—that it is quite equal in scenery, but if any of your readers are attracted by descriptions of it to spend any time there, I think it is as well that they should know that there is something South to be done as well as North—the one being within a comparatively short distance of the other. The emulsion processes have, from their great simplicity, again wedded me to my old favourite pursuit of landscape photography, after a divorce of some twelve years or more, and I have read with great pleasure the paper of Mr. Warnerke, as anything tending to lessen weight will be a great boon to all landscape photographers. Our cameras (even the best of them) are more than twice or thrice the weight they ought to be, and I think that if our Society can do it, they should offer a prize for a camera and slides, offering the greatest attraction in lightness and portability. There is much to be done in this direction.

It is so long ago that I forget when and where I proposed in one of the photographic journals a camera slide having a roller at each end, and a band of sensitized collodion on a collodion and india-rubber support, with a spring pad at the back to hold the paper tight against the glass during exposure; therefore I am glad to see that Mr. Warnerke has taken up this idea, and put it into practice. A slide could be constructed having an arrangement to admit various pieces of mica of different sizes, which would take a curve suitable to the focus of the particular lens used, and around which the sensitized film could be drawn. WALTER B. WOODBURY.

[Mr. Woodbury encloses some admirable prints from the plates to which he refers. We know that the use of film negatives was a favourite idea with Mr. Woodbury years ago, and some of his experiments were described in our pages. He, in common with all landscape photographers, will be gratified with the perfection to which the idea has been worked by Herr Warnerke.—ED.]

Talk in the Studio.

CATALOGUE.—Mr. Cooke, of Hoxton, has forwarded us a copy of his new illustrated catalogue, which appears to be very comprehensive, and will interest all photographers.

PHOTO-LITHOGRAPHIC REPRODUCTION.—We are favoured by Mr. Carbutt with an example of photo-lithography in the shape of a reproduction from an old etching of a quaint piece of antique architecture in Chester. We have rarely seen better or finer lines in photo-lithography. The crisp, sharp character of the etched work is reproduced with marvellous fidelity, and, but for the fact that there is no relief or burr, the print might easily be taken for one of the original etchings.

EXPRESSION IN CHILDREN.—We have received from Mr. Hicks (Charles and Hicks, South Shields) a packet of children's portraits which are very charming and interesting. Mr. Hicks remarks, "It is not so much technical excellence as expression I go in for." This is just the secret of success with children, and Mr. Hicks has attained that highest charm in any form of portraiture, and pre-eminently in presentments of children—happy, natural, unconscious expression. The children have evidently not been worried by much posing and arrangement. If they are conscious at all that they are being photographed, they are regarding it somewhat as a good lark in which they are participating, but still keeping "within the limits of becoming mirth." The result is success, which many photographers, struggling unavailingly after the highest technical excellence, generally fail to secure. Here are the instructions which Mr. Hicks presents to parents and nurses, which may prove suggestive to some of our readers:—"To secure satisfactory and pleasing portraits of children, never say anything to them as to how they are to stand, sit, look, behave, &c., and on no account impress upon them that they are to keep still. If they like to run about the studio and play, let them do so; it is quite at their service to turn into a nursery, for the time being, in reason. Dress very young ones in white, if possible, and it is advisable that all children should be dressed in light materials, such as blue, mauve, pink, &c.; reds, dark browns, or black velvet, as a rule, are objectionable, unless relieved with white. If the above suggestions are attended to, and appointments made for children or family groups, a satisfactory picture can always be secured."

CEMENTING JET, ETC.—Shellac is the best cement for jet articles. Smoking the joint renders it black to match.

SILVERING PAPER.—Having never anywhere seen a rule given for the length of time paper should be silvered, and having many times seen articles contain instructions which said, "silver the requisite time," and being at a loss to know what a "green hand" would do with such definite instructions, I am constrained to give the following, which, as far as tested, has proved O. K. Paper which, when removed from the solution, and held by one corner curls back, is under-silvered; that which curls front, is over-silvered, and that which stands straight "a jif," and then curls back, is just right; 'tis better to under-silver than over, for paper which has been silvered too long is very prone to turn yellow.—*The Philadelphia Photographer.*

To Correspondents.

RON ROY.—The absolute right to reproduce portions of a newspaper, whether paragraphs, or Births, Marriages, &c., without acknowledgment, is an undetermined point of copyright law. It is generally held that there is no copyright in newspaper articles. We think there is no fear whatever of any one objecting to your copying any such paragraphs by photography, whether for private use or for sale. 2. The absolute legality is, as we have said, undetermined. 3. The production of instantaneous views depends on other things besides the sensitiveness of the plates. The condition of the light, the character of the subject, and the construction and angular aperture of the lens, are all factors not less important than the sensitiveness of the plate. With a rapid lens and good light no doubt the plates in question would yield good instantaneous pictures. We cannot recommend any maker's lens by name in this column. You must see that the task would be a very invidious one. 4. We cannot tell you what size in photographic views is most saleable.

J. J. JEROME.—The plates which you call "ferro-plates" were doubtless those sold by Mr. Atkinson as "Nonpareil" plates. You do not state whether the collodio-chloride was that sold for printing on these plates, or some prepared by yourself. We have never seen or heard of a case in which the white coating has been dissolved off the surface; hence, in order to form any judgment as to the cause, it is important to possess all details clearly stated. You do not state at what point the white coating dissolved; but we presume from your remarks that it was in the toning bath. It is probable that the use of a solution of acetic acid much too strong may have been the cause. The tone will depend much on the toning bath employed; to obtain richness we prefer a weak acetate bath, or sulpho-cyanide bath.

A. G.—Much depends on circumstances as to the best size of studio. For ordinary work in portraiture about 26 feet by 10 or 12 feet; ridge roof, 6 feet height at eaves, 14 feet at ridge. On north side and roof, 6 or 7 feet at each end opaque, the remainder of the glass to within 20 inches of the floor. On south side it is as well to have a little glass to meet contingencies of lighting, but as a rule it would be kept covered with blinds. Belgian sheet glass is, we believe, the cheapest, and will answer every purpose well.

W. GOTTHARD.—It is doubtful whether the earth through which you state the various waste solutions from which your sink has filtered will contain much silver; but your best plan will be to send a small parcel of the earth you have preserved to a refiner, who will tell you whether it contains any silver worth recovering, and what it is worth. You will find the names of various refiners in our advertising columns.

H. H. H.—You are confounding two operations. Sunning a bath will throw down organic matter without permanganate, and permanganate will remove the organic matter without sunning. If you wish to sun a bath, add a few drops of a ten-grain solution of carbonate of soda, just sufficient to produce a slight turbidity; then pour into a flat dish, and expose the solution to strong sunlight for a few days. The first effect you will notice will be a general discolouration of the bath, and finally the precipitation of a black deposit. Filter, and try the bath. It will probably work well at once; if it fog, add a little nitric acid. The addition of permanganate removes the organic matter without sunning. The instructions you have read are correct. So long as the bath clears after the addition of permanganate, there is organic matter present; when a faint pinkish tint remains, the permanganate has done its work. Liquid ammonia and carbonate of ammonia are not the same thing. When the term ammonia alone is used, the liquid is referred to. Carbonate of ammonia is a combination of carbonic acid and ammonia. Of course, as you diminish the bulk of the bath, a portion of the nitrate of baryta in solution is removed with the solution used up, but the remaining solution does not get weaker in the baryta salt as it does of silver. The two terms mean the same thing.

A. WARD.—The lighting of your card portrait is not bad; but a slight degree more brilliancy would be an improvement. In sunning down the margin of a vignettéd print, you should be careful to avoid getting the margin darker than the tint of the background round the head, and to blend the graduated edges of the vignettéd portion into the tint of the margin. We are glad to learn that you derive benefit from perusal of the News.

E. BRABAZON.—You do not state any of the conditions which make the picture difficult to copy. Some oil paintings present difficulties because of the non-actinic colours used; some because the varnish has bloomed; some because it has assumed a leathery semi-opaque colour partially obscuring the painting; some simply because they are dirty. A good deal of skill, intelligence, and experience are necessary to succeed in such work. With most old oil paintings it is wise to supply a sponge and tepid water to the surface. This not only removes dirt, but whilst the surface is moist makes the detail bear out better. Use a freely bromized collodion, good light (open air by preference), full exposure, and weak iron developer.

S. M.—It entirely depends on what kind of varnish. If ordinary spirit varnish, then there is nothing better than repeated application of strong alcohol to remove it. If a benzine varnish, then use benzine. Some varnishes are very difficult to redissolve without injury to the negative. In such case the tincture of iodine applied upon the varnish, as we have often described, is the best mode of intensifying further.

TOM.—Yes: hypo will answer for fixing all kinds of negatives. It may be used very strong—half a pound in a pint of water.

HENRY H. MOODY, (Colorado.)—We have sent you one or two numbers of the News which will probably serve. 2. The Calotype Process as worked and described by Dr. Diamond is still the best form of that process. You will find in the copies of the News forwarded, a film process by Herr Warnerke described, which seems admirable, and will possibly just meet your purpose for mountain photography.

RECEIVED FOR REJLANDER TESTIMONIAL FUND.—Five shillings from J. Corder, Sen.

Several Correspondents in our next.

*The Photographic News, July 2, 1875.*PHOTOGRAPHY IN AND OUT OF THE STUDIO.
THE LAST ECLIPSE EXPEDITION—DETECTION AND DECEPTION IN PHOTOGRAPHY.

The Last Eclipse Expedition.—It is sad to think that the last eclipse expedition sent out to India has been partially, if not wholly unsuccessful. The Royal Society have been at great expense in sending out observers, and these have undertaken a long and dangerous journey to little purpose. To ascertain the composition and nature of the corona, that white halo, or glory, around the sun when eclipsed, and which has several times been photographed, was the problem to be solved, and the spectroscope was to tell us the precise nature of its composition, while a photographer, Dr. Vogel, of Berlin, was to endeavour to get a record of its spectrum on a photographic plate, an attempt which, if successful, would have certainly been the most important result of all. The period of totality was four minutes and twenty-two seconds, and, consequently, there would have been ample leisure for making any observations, and probably sufficient time for such an exposure as Dr. Vogel would require to give in order to secure a spectrum picture of so feeble an illumination as the corona. Unfortunately, the interposition of a heavy cloud at the eventual moment rendered abortive every attempt, and we shall have to wait a very long time now before we get such an opportunity again. Three years hence there will be another eclipse, with a totality of two minutes and forty seconds in America, and in 1886 there will be one in Africa lasting six minutes. To photograph a spectrum of the corona, a very long exposure would be necessary; but Dr. Vogel was very sanguine about being able to secure such a phenomenon within the four minutes and odd seconds at his disposal. He said that he obtained a spectrum of the sun in a quarter of a second, but, of course, the halo of light round the sun's disk when this is quite shut out from view is a very feeble source of illumination comparatively. As we have said, a vexatious cloud got in the way just at the time of totality, but Dr. Vogel likens the illuminating power of the corona under those circumstances to that of a full moon, although it may have been a little brighter. Under these circumstances it might, we certainly think, have been possible for Dr. Vogel to have got an image, especially as he was using tinted films, which would enable him to secure the less refrangible colours of the spectrum more speedily than with simple uncoloured collodion. We much regret to hear, from Dr. Vogel's letters, that the arrangements made for the party of observers were far from satisfactory, and that although our Berlin collaborateur was present as a guest of our Royal Society, he was altogether unprovided with the necessary apparatus for his work. When a scientific gentleman agrees to take part in a long journey to a distant part of the world, and to undergo all sorts of privations and discomforts, the least to be done would have been to see that he was properly provided, and that every want was satisfied. It seems that even the Governor of the Nicobar Islands was without instructions as to the proper reception of the observing party, and consequently he paid them little attention, and, so it appears, treated them with scant courtesy. If scientific men come to hear of Dr. Vogel's experience, it will be a long time before any gentlemen will be found to volunteer for future expeditions.

Detection and Deception of Photography.—The recent instance of obtaining money under false pretences, which was tried in Paris, and led to the exposure of a so-called photographer, demonstrates very clearly the value of knowledge of photography on the part of the police. In this country, it is true, we have taken to photographing criminals, and thus securing a record of a suspicious individual, which may be troublesome again, but this service is

rarely performed by a Government employé, and where even this is the case, the photographic duties devolve upon the head jaoler, and are not in any way connected with the police force. In France it is different, for, as our Paris Correspondent recently informed us, there are among the detective police in that metropolis a staff of official photographers. These have the rank of inspector, and do not merely execute portraits of the criminals that come under notice, but they prepare photographic sketches of objects, or localities, or reproductions of documents, such as are required from time to time in evidence. In the swindling case recently tried in Paris, it was only with the aid of a photographer-detective that the affair could have been found out at all. Two detectives, one of whom was on the photographic staff, repaired to the establishment to be photographed "with a spirit," and after a little while he was requested to sit down, and a dark slide was brought in by an assistant for exposure. It was then that the photographer saw his chance, and he never let the dark slide out of sight until he had retired with it to the dark room, and developed the plate forthwith. He did not allow the operator to proceed with the portrait, but shrewdly guessed, no doubt from a critical inspection of a spirit photograph beforehand, that the plate was faintly impressed with a ghost of an image prior to its being brought into the studio. The supposed unexposed plate, on the developer being poured over it, showed to the detective's eyes the "spirit" image he was looking for, and then it was little use for the operator to state that he had not previously exposed the plate. Indeed, having been found out in the fact, there was little good denying it. On searching the house, the detectives found, as they expected, a whole collection of *mannikins* of all sorts and sizes, suitable for the purpose. It is very questionable, indeed, whether the "spirit photographer" would have been detected by anyone unacquainted with the nature of photography and the manipulations connected with it. There is nothing so easy, in fact, as for a photographer to deceive a person unacquainted with the art; there are so many ways that occur to him of blinding the sitter, that really the only surprise is, that tricks of one kind or another are not more frequently heard of. We may mention two instances of *hocus-pocus* with the camera that recently came under our knowledge. An amateur friend of ours, who had been studying the YEAR-BOOK of three or four years ago, contended that he had in his studio at home a glass shade large enough to cover a full-grown human being, and to prove his case he exhibited to his friends shortly afterwards a full-length portrait of himself underneath it. Nothing could have been more conclusive, apparently, than the picture, and yet he afterwards admitted that the shade was but twenty-two inches high, and that he had only taken the portrait and shade, one after the other, on the same plate, receding with his camera for some distance after securing the image of the glass shade, in order that the standing figure might be represented of a size well within that of the glass. The other deception we saw practised might have led to serious consequences. A gentleman and his lady-love went to our friend to be photographed. A good picture was secured of the gentleman, and then came the lady's turn. She sat on a chair, and was posed and photographed in due course. Hardly had the exposure terminated than the lady was called into the next room, and then another gentleman promptly took his stand in a loving attitude beside the chair just vacated. Only half of the plate had been devoted to the lady, the diaphragm was shifted, and on the second half was impressed an image of the standing gentleman. Of course, when the plate came to be developed, there was the lady sitting down, and in friendly proximity, leaning on the rail of the chair, was not the swain, but another. It was no use for the lady to protest that the picture had been taken without her consent, and to make matters straight, and pacify the wrathful lover, the negative had to be broken then and there,

A NEW METHOD OF EMULSION WORK.

BY GAREY LEA.*

Concentrated Collodion.—In equal parts of alcohol and ether, dissolve eight or ten grains of a suitable intense pyroxylin (that made for the purpose by Mr. Peter Pary is what I have found answer best). To each ounce of mixed solvents take

Ordinary crystallised cadmium bromide	...	7 grains
Ammonium bromide	...	2½ "
Ammonium iodide	...	2 "

Add to each ounce two drops of aqua regia, sensitise with twenty-five grains of fused silver nitrate, and then add for each ounce two grains of cobalt chloride dissolved in alcohol. It will be found best to put the first three salts together into a large test-tube for small quantities, or a flask for large ones; cover with a proper quantity of alcohol, and heat. The ammonium bromide does not dissolve very easily in alcohol, but much more so in the presence of the other salts than alone.

Fused Silver Nitrate.—I have always found an advantage in using the fused nitrate. It can, I believe, be bought fused, or it is easy to fuse it in a small porcelain basin over a good gas flame; a Bunsen's burner is the best. It should be kept in a state of fusion about ten minutes, and then be let cool in the capsule.

[I may remark, in passing, that the proportions of silver nitrate which I am using at this day, as the best that I can find, are exactly those which I recommended just five years ago, viz., in April, 1870. To three ounces of the concentrated collodion just described, I add seventy-five grains silver nitrate. And as this affords four ounces of finished collodion, there are exactly eighteen grains and three-quarters of silver nitrate to the ounce, the only difference being that to avoid unnecessary waste of solvents, the collodion is made at first in a more concentrated form. Again, this quantity of silver gives, after saturating the soluble haloids, between fourteen and fifteen grains excess for the four ounces, or between three and four grains excess to the ounce. So that both in actual quantity of silver, and in actual excess, I use now, within a fraction of a grain, the same quantities as in 1870. This has not prevented Colonel Wortley, who has been endeavouring for years past to appropriate the results of my labours, from charging me with copying these proportions from him. As his first publication on the subject was in June, 1871, it will be seen how baseless is this allegation. The gentleman just named had, in fact, appropriated my work and my ideas so completely, that I was not to be allowed to use them myself.]

Cobalt Chloride.—As a chloride I recommend cupric chloride, known in commerce as muriate of copper. But the commercial salt varies so much, that I think it best to use cobalt chloride, which resembles cupric chloride in dissolving very easily in alcohol. The silver nitrate is to be ground up and dissolved in alcohol by putting it into a test-tube and boiling it with alcohol, shaking well. As soon as the first portion of alcohol is saturated, it is poured off into the collodion, and well shaken up. More alcohol is poured over the silver, and boiled again. Generally three heatings with alcohol will be required.

Aqua regia may be obtained from any druggist by directing him to put into a stoppered vial an ounce of muriatic, and half an ounce of nitric acid, both of ordinary strength. The aqua regia should be added to the collodion before the silver; the cobalt chloride half an hour or an hour after adding the silver.

The emulsion should be well shaken up at intervals, and is ready for use by leaving it to stand over night, shaking it as often as convenient. Its preparation seems a little complicated to describe, but is in reality simple enough. The emulsion being made, it is next poured out to set. It must not be too deep in the pan: a 7 by 9 will answer for three or four ounces, and larger ones in proportion. It should be once in awhile moved about, to equalize the drying and pre-

vent the formation of a leathery film on the surface. Or this may be allowed to form, and then be pierced with holes, and the liquid be let flow through, and soften it again. The object is to get the whole into a gelatinous and not a hard condition. As soon as it no longer moistens the tip of the finger, it is ready (this will take from one to three hours, according to temperature and quantity). The preservative, whatever is preferred, is next to be poured over the film in the pan, and the film itself broken into flakes with a porcelain or bone spatula, ploughing it up and separating it completely from the bottom; then transfer the whole, bath and flakes, to a large deep glass jar, and stir well at intervals. A contact of ten or fifteen minutes will be sufficient, reckoning from the time of pouring the preservative into the pan. The preservative is then poured off, water poured in, and the whole well stirred. After several changes of water, the flakes are let to lie and soak for an hour, then several changes, then soak for another hour, several more changes, and then dry, first squeezing out all the water possible. As the flakes dry very slowly, this may be hastened by putting the porcelain pan in which they are spread out to dry, on a stove or other warm place, taking care that the bottom of the pan is not made warmer than the hand can conveniently bear. The dried flakes are not white like the emulsion, but grey; still they give a white emulsion again. To emulsify them, put them in a vial with a mixture of equal parts of alcohol, ether, and plain collodion, in such quantity that there shall be four ounces of liquid for each three ounces of original emulsion. The new emulsion should be often and sharply shaken; it should not be used for at least two days, and is much better to keep for four or five.

Preservatives.—A few words are needed as to the preservative to be employed. That which I very much prefer is made as follows:—

Water	...	12 ounces
Thick gum solution containing about one-quarter as much sugar as gum	...	1 ounce
Prepared albumen	...	1 "
Sixty-grain solution gallic acid in alcohol	...	1 ounce
Sixty-grain solution of tannin in water	...	½ "

It may seem a little complicated, but is worth the trouble of making. It is for all dry-plate work the best preservative that I know by a great deal. It is essential that the ingredients should be added in the above order.

The prepared albumen is made by shaking up white of egg with an equal bulk of water, and adding twenty-five minims of No. 8 acetic acid for each ounce of white of egg, filtering through a sponge. It keeps indefinitely.

Gum-gallic preservative does not answer well; it gives a very sensitive plate, but one that is easily over-exposed and spoiled. It needs the albumen and tannin to prevent this.

Coffee and Gallic Acid.—Decoction of burnt coffee with some gallic acid gives a very good preservative, but not equal to the first mentioned. Tannin alone does not do well; there is apt to be a granular deposit when tannin is used, unless there is albumen present to prevent this.

In a word, those who wish to get the best results for negatives will do well to use the first described preservative, also for transparencies for the lantern. For ordinary transparencies, to be viewed as held up to the light, the coffee and gallic-acid will do very well; in this way a more intense image is got.

Development is the same as described last month. This is a most fascinating process. The facility with which the plates are made, their sensitiveness, and their easy development, the getting rid of the trouble of backing and cleaning, render the work particularly pleasant. The trouble and labour of photography seem to be eliminated, and only the pleasant part left.

I have found another method of preparing this sort of emulsion, which can be only very briefly mentioned here, partly because my paper is already so long, and partly because I have not yet determined the best mode of

managing the details. It is likely, however, to become an important process.

It bears the same relation to the making of dry plates with a bath, that the process already described does to making them with an emulsion. In fact, it may be briefly characterized as an alteration of the ordinary bath dry-plate process, in such a way as to perform all the operations once for all on a quantity of collodion, instead of on each separate plate. Instead of going through every separate operation on each one of a thousand dry plates, the collodion with which they are to be made undergoes the treatment once for all. Thus, a quantity of any collodion whatever is poured out into a pan (say half a pound into an 11 by 14 inch pan), or let set; then a silver bath is poured over, the film broken up into flakes and lumps, and after a sufficient time (say from twenty to forty minutes, according to the strength of the bath), the latter is poured off again. Then a preservative is applied, and washed out again, and the flakes are dried. Lastly, they are emulsified with alcohol and ether. This emulsion needs, like the first described, only to be poured out on glass, and let dry. If the collodion used contains an iodide, there will be no backing needed.

It will be seen, I think, at a glance, how very popular this method is likely to become. I have already made a large number of emulsions in this way with different preservatives, and the plates made with them have shown about the same degree of sensitiveness as those ordinarily made with a silver bath. This is considerably inferior to the high sensitiveness obtained by the method first described in this present paper. I am desirous of bringing up the sensitiveness of the second method to the same point as the first, and this is a matter upon which I am now engaged, and may probably make report at the next meeting of this Society.

I have described in this paper two methods of work, of which the principles are so new that they could be easily and completely covered with a patent; and as I believe that emulsions made in this way will be largely manufactured commercially for the use of photographers (perhaps even to some extent taking the place of wet collodion), such patents would be very valuable. I have preferred, however, to lay no restrictions on their use, but to give them to all who may wish to use them.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER IX.

RETOUCHING THE NEGATIVE.—THE RETOUCHING FRAME, ETC.

The Scope of Retouching.—Much has been said and written against retouching, and as it is a subject which is attracting more and more attention of the artistic photographer, a few words in reply to the objections raised will, I deem, be in place, especially as a great deal that must be conceded to the position of the objectors will serve as warnings in the use of this important and beautifying operation, especially as most of the hard things said of retouching apply to the abuse rather than the proper use of the pencil. To those who hold that a negative should not be touched at all, I fear no arguments would avail, as not the most convincing argument will ever move *prejudice*. From all that I have seen or heard of these objectors, their ideas are based on the ground that the retouched negative ceases to be a *photographic* production. If this is so, which I do not by any means allow, it still fails as an objection where every means of any kind tending to an artistic and truthful result should be warmly welcomed. It is, though, on these points of

ART AND TRUTH

that the true objections resolve. Are the artistic and truthful qualities of a portrait enhanced or not by retouching?

Too often they are not only not added to, but entirely obliterated.

But the fault is not with "retouching," but an injudi-

cious removal of all lines, muscles, natural defects and CHARACTER from the face. Thus, under the hands of the mechanical, unthoughtful worker, that index to character, the face, loses every line and shadow that gives it individuality, substituting an unmeaning block of ivory-like roundness and polish and *vacancy*. Under such a polishing process all claims of art are thrown aside—all truth is obliterated. The evidences of the ravages of age, by the agency of retoucher's pencil are wiped away, and a staring wax face left to represent (?) a human face.

Had my pen a good sarcastic point to it, then would I worry these rogues who so falsify photography and bring such discredit on the profession they pervert; but, unfortunately they are popular! There is, be it confessed with sorrow, a touching confidence in the *truthfulness* of the camera directly its work is falsified, and in proportion as it is thus flattered. Mrs. Fortie cannot gaze with fortitude on the evidence that she is no longer young, but complacently smiles on the picture which represents her as buxom twenty. It cannot be urged that photographers must supply what is demanded, for they themselves unloosed the giant they have now to fight.

Another real objection is, that where, before the introduction of retouching, the operator strained every power to make each negative perfection, he now is careless, leaving it to the retoucher to supply all deficiencies of lighting and development, and to "dodge up" generally. This should not be; it is an abuse of power which should be vigorously fought, but is no objection against retouching, any more than would the statement that the convenience of railways causes people to neglect taking sufficient exercise to keep them in health, be a reason for the abolition of convenient and rapid locomotion.

But I fear my reply to those who object to retouching has taken the character of a little abuse on my own account of those who misuse the pencil and brush. Let it stand so; perhaps in that form it may have more weight.

Retouching was introduced by gentlemen whose artistic taste was shocked by some of the more glaring shortcomings and falsifications of the photographic camera. My readers know, or will learn as they gain experience, that the camera does *not* reproduce an image as it is visible to the eye. Nor am I now speaking of colour, but that representation an artist would make of a sitter in black and white. To quote an instance or two:—Freckles, often not perceptible to the eye, are brought out by the camera as black spots. Surely here nature is falsely portrayed, and their obliteration by retouching is allowable. Take a sitter with that much-admired tint of hair, auburn; how does the camera reproduce that? As black! Here something must be done. In the first place, powder is applied to the hair before the sitting is made, and the negative is retouched.

Retouching, then, should be used to remedy these and kindred defects of photography as it is with our present appliances and knowledge, and accidental defects of the negative which cannot be remedied by a second sitting.

Preparation of the Surface of the negative is necessary, as the glaze of the varnish will not receive the pencil-marks. For this purpose, I have found spirits of turpentine rubbed on those parts to be retouched gives an excellent surface or "tooth," where a great amount of work is not requisite. The addition of cuttle-fish, very finely powdered, to the spirit of turpentine, has been recommended; but very finely powdered pumice-stone has the largest number of advocates. To prepare it, rub together two pieces of the stone, by which means you are enabled to get it very finely powdered, and entirely free from grit. This powder is kept in a fine muslin bag, through which it falls when lightly dabbed on those parts of the negative to be touched. Rub the powder very gently with the ball of the third finger until the glossy surface is removed, but not sufficiently to scratch the delicate film beneath.

Caution is necessary to rub off only the polish of the

varnish which must of course be perfectly dry and hard—and only rubbed on those parts on which you want to work. The negative thus prepared for the reception of the pencil is placed on the

Retouching Frame, of which there are several patterns sold by the stock dealers. In its more elaborate form it consists of two frames and a lid. The bottom frame, resting on the table, holds a movable mirror to reflect the light to the under side of the negative; to the front of this frame (that nearest the retoucher) is hinged another frame of ground glass, on which the negative to be retouched rests, which opens to an angle of about thirty degrees. On the further (and, when open, higher) edge is hinged a light lid of wood opening to nearly a right angle with the frame on which the negative is retouched, which shades the extraneous light from the eyes of the worker. This rising above the head of the retoucher has to be sometimes supplemented by curtains on each side. These frames are very handy, being extremely portable; but I am compelled, except on dark days, to substitute a sheet of white paper for the mirror, as the glare of the reflected light is very trying. Where a window of northern aspect may be commanded, I have used a home-made frame, costing very little, and being much more serviceable. The subjoined sketch will, I think, explain it.



If a reflector is needed, a sheet of white paper is placed on the table, or a mirror when the light is very weak. I have no ground glass under the negative, as I find no use for it, and the eyes of the retoucher are splendidly shaded without the necessity of smothering the head in a dark cloth.

A sheet of brown paper, with a small hole cut out, is placed over the negative and aperture of the frame to shut out the light, except just where you are working, preventing an excessive glare to the eyes, and rendering the illumination of that portion to be worked upon more brilliant.

Retouching Materials.—Pencils, Faber's H, HHH, and B; "stumps," which can be made by rolling up tightly a piece of unsized paper, for rubbing in large shadows that require softening (the lead may be scraped off a B Faber); india ink mixed with a little gum.

(To be continued.)

PAPER ON ASTRONOMICAL PHOTOGRAPHY.

BY G. D. CHAPMAN.*

ASTRONOMICAL photography may be divided into two classes: one is very much like taking the pictures of children—that is, it requires to be done in the shortest possible space of time, as the object is continually moving; the other is like photographing the interior of buildings and dark objects, where the light is not sufficient to produce the desired effect without giving a very long exposure. The first class is solar and lunar photography. It may be asked, does not the image of the sun and moon stand still, with the exception of a steady motion due to the revolution of the earth on its axis? I will say that they do not, and that there is where one great difficulty lies. The steady motion due to the revolution of the earth is overcome by the driving clock which keeps the telescope moving with the object; but the chief trouble in this class of work arises from the continued vibratory motion of our atmosphere; still, if those movements were only lateral, then an instantaneous exposure, such as we are enabled to give the sun (which is the one-hundredth part of a second), would give us the desired sharpness. But there are atmospheric waves of unequal density passing between the object and telescope, which have the effect of lengthening and shortening its focus, so that the image is continually moving in and out of focus, as well as in every other direction. It is this changing of focus which causes the trouble in solar work, for there is but one chance in many that the object will be in focus when the picture is taken.

In lunar photography we are even less fortunate, for the time of exposure required to make a negative of the moon varies from one-half second at full, to several seconds at the partial phases, so there is no such thing as instantaneous exposure in this work. To assist in overcoming these atmospheric difficulties, our only remedy is to wait and watch; and, in case the conditions are not favourable, we are not compelled to make a blind sitting for fear of losing the customer, and then say, "Please call and see a proof in a few days," for she is a regular customer, and if we get two or three good nights in a year in which we can make good moon pictures, we think ourselves very fortunate. But with stellar work the conditions are not the same in all respects, for we do not demand that degree of stillness in the atmosphere, as there is no detail to be obtained, as with the sun and moon; still we require the maximum amount of sensitiveness in the chemicals, with additional demands on their good behaviour under very trying circumstances. It is now necessary that they shall be in such a condition as to admit of the sensitive film being kept from twenty to thirty minutes, and longer if possible, and when developed it shall be free from markings of all descriptions. The stars, not having the same amount of motion either in rate or direction, it is desirable to get as many as possible in each group, for, by so doing, we obtain a greater amount of information with the same labour. Even with the longest exposure which can be given, and the utmost sensitiveness of the chemicals, assisted by a supplementary exposure to light (which increases the sensitiveness about one-third), there still remain vast numbers of stars beyond the reach of photography in its present state. To show the increase of sensitiveness by a supplementary exposure to light, I have here the original plate which revealed to Mr. Rutherford that fact in March, 1866. A candle was standing so that its light fell upon one side of this plate, and you will see a very great difference in the sensitiveness, for the stars which make no trails on the unexposed portion make strong trails on that part which was exposed to the light. These trails are lines made by the stars while the telescope is standing still, the same as the streaks made by bright objects passing in front of the camera when taking views. The advantage derived by this treatment was so decided that it has been in constant use in this class of work ever since. By it we are

* Continued.

enabled to get stars smaller by at least one and one-half magnitude.

As all of our work requires to be done in the shortest possible time, my first experiment was to get a collodion which should combine the greatest amount of sensitiveness with stability, if possible, as it would sometimes be a week or more between the working nights. The advantage of having a collodion in good working order at all times is of great importance. In order to make reliable tests for sensitiveness it is necessary to have some means by which to compare the results with considerable nicety. To do this I constructed a photometer as follows:—Taking a piece of wood about two feet in length and one inch in height, I fixed a gas-burner to one end and about six inches in front, then I placed a row of cylinders, covered with white paper on the top of this piece of wood, so that each succeeding cylinder ranged one inch farther from the light. And as the illumination received by each diminishes in proportion to the square of the distance the cylinders are from the light, negatives made of these will very readily show the relative sensitiveness of the chemicals employed, if the light and time of exposure are so reduced that in no case shall all of the cylinders make an impression on the film.

I have made nearly one hundred trials for sensitiveness, and have kept a record of how each was made, and of its qualities. The most important element for sensitiveness is in the cotton, and the relative proportions and purity of the alcohol and ether of which the collodion is made. That cotton which burns quickest and dissolves rather slowly, leaving a small amount of sediment, and making a rich creamy film, when fully sensitized and salted with about four and a half grains of cotton to the ounce of collodion, is the most sensitive. Cotton which makes tough, horny, and nearly transparent films work slowly, but can be improved by using an excess of alcohol. The ether is often acid; this is also very detrimental to sensitiveness, and has at times given me considerable trouble. I have never had any difficulty with Atwood's alcohol. The albumen should be used as thin as possible where sensitiveness is required, as that also has a retarding influence. With regard to the salts employed I have not found any material difference in sensitiveness, but each has peculiarities of its own in other respects. There is one point in the age of an ammonium collodion where it is equal to any other, but that period is of short duration. A combination of magnesium and cadmium gave good results, but there was not difference enough to make it of any advantage to use. Of all the different kinds of salts there are none better than cadmium for my work; it has sensitiveness equal to any, with stability combined, and may be used as soon as made.

The amount of salting I use is six grains of iodide and two of bromide to the ounce of collodion, with sufficient tincture of iodine to give it an orange colour.

The next question was, whether very sensitive chemicals would stand long exposures. In testing this question I found that it required a little more acid in the bath for long than for short exposures, which diminished the sensitiveness slightly. The chief difficulty I had to contend with in long exposures was "matt silver;" I have examined every work on photography within my reach, and do not find one that gives either the cause of or cure for this trouble. I was annoyed with it more or less until one summer I had what may be called an epidemic. One set of chemicals was extremely rich in producing it. I did not seek to get rid of, but rather encouraged it, in order if possible to find its cause. My first experiments were to produce the same effect at will; this I considered would be the key to both cause and cure, and so it was. The results of my experiments proved that by adding some organic matter, like gelatine, to an acid bath, I could produce beautiful specimens. It proved to be a deposit produced by the action of the atmosphere on the compound of acid, silver, and organic matter.

It requires all four to produce it, and as I was at a loss to see how I could get along without the atmosphere or silver, I was obliged to turn my attention to the other partners in the transaction. Being obliged, as I am, to use albumenized plates which constantly add organic matter, it is impossible to keep the silver solution free from it for any length of time.

I find also that collodion made from certain kinds of cotton furnishes the bath with organic matter. It appears that the action of the acid in the manufacture of the pyroxyline, renders a portion of the collodion, soluble in water, which washes out into the silver solution. In precipitating the cotton by water, out of different samples of collodion, I found that some lost more in weight than others. I then evaporated some of the water, and found quite a quantity of organic matter had been washed from the collodion. I wish some further experiments might be made in this direction. It is a well-known fact that neutral silver will precipitate the organic matter in strong sunlight; it will also do it in the dark, but not so rapidly. The nearer neutral the silver solution is, the less organic matter it will hold in suspension. I find that a neutral solution works well for short exposures, when the plate has not been allowed to remain in it over three or four minutes, and is developed immediately after. But in long exposures the neutral silver will fog, and so will the acid solution, if there is organic matter present, but these two classes of fogs are entirely different character. The first or alkaline fog is entirely under the film, and cannot be wiped off without disturbing it. The other or acid fog is wholly on the surface, and may be wiped off without breaking the film. This acid fog is what makes "matt silver," when it gets thick enough to produce streaks, which adhere to the film during long exposures; the larger the amount of acid in the silver, the greater the capacity for holding organic matter, and the thicker will be the surface fog with long exposures. With an acid solution there is little or no precipitate of organic matter, but if the silver is nearly or quite neutral, then the dipper and sides of the bath will be covered with a dark deposit of organic matter. So if the solution is not overworked it will keep itself clear from the matt silver trouble, if the scum which floats on the top of it be frequently removed. One test I have for acidity, which is a very good one, is to touch the surface of the collodion film with my finger in several places before dipping it in the bath (using a finger which has no chemicals on it), and when the plate is developed, if the places touched do not show any darkening more than other parts, there is too much acid present. I then add soda or ammonia to the bath carefully, until there is a slight darkening of the spot touched; sometimes it is a dark ring on the edge of the spot, at other times there are dark spots representing the markings in the cuticle; this depending upon the amount of pressure and quantity of organic matter left on the film (if it is too alkaline the spot touched will be very black all over, or nearly so). This is, as far as I know, a new and very delicate manner of testing the right amount of acid in the bath.

In conclusion, I find the best way to keep clear of the above trouble is to keep the silver solution as near neutral as possible, and steer clear of the alkaline fog; filter often, and do not let the plate remain in the bath over three or four minutes; then draw out quickly. By so doing, the scum is prevented from adhering to the film by the solution which is in contact with the plate rising and flowing outward at the surface, leaving nothing but clear solution on the plate; and if this is not surcharged with organic matter there will be no surface deposit. If my film has a fog on the surface which can be wiped off, I add to the bath a dilute solution of ammonia or soda, and when the proper quantity has been added it will work beautifully clear and quick, if there is nothing in it to produce fog but organic matter.

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THE REJLANDER MEMORIAL FUND.

ONE of the highest compliments ever paid to photography by an art critic appears in a recent article in a daily contemporary, in a notice of Mr. Armitage's picture in the present exhibition of the Royal Academy. Referring to the recognised and long established modes of portraying the passions, based on the "stately academic canons laid down by Lebrun," the writer affirms that they have been finally scattered to the winds by the wonderful photographs of the late O. G. Rejlander, especially noting the illustrations to Dr. Darwin's work on expression, and Ginx's Baby, as examples. Photography may thus become art teacher, as well as pupil. But it is only in the hands of a master like the lamented artist to whom we have just referred that photography can assume such a position; and such men redeem photography from the low status to which, in unscrupulous and incapable hands, it is at times dragged down.

We refer to this especial fact in the character and history of Mr. Rejlander for a special purpose. All photographers are in some sort the heirs of Mr. Rejlander's lessons in art—all in some sort the heirs of the status and prestige he helped to confer upon the art—and therefore all in some sort owe him a debt. The fund established by a committee of gentlemen interested in the art for the purpose of discharging the obligations which accumulated during a lingering illness—and so guaranteeing to Mrs. Rejlander the undisturbed possession of the art negatives and other effects as a means of income, in accordance with the last expressed desires of the dying artist—still falls somewhat short of the necessary amount. To the committee it seems imperative that the purpose just indicated should be achieved; and it is desirable that some small fund at least should also be placed in the hands of the bereaved lady. It is, moreover, very desirable that these things should be accomplished without further delay. As we are satisfied that many of our readers who will gladly contribute to the fund have failed rather through procrastination than unwillingness, we venture to ask them for prompt aid, and to add the well-worn axiom, *bis dat qui cito dat*.

PAPER AS A SUBSTITUTE FOR GLASS.

VARIOUS singular changes have of late years been taking place in the practice of photography, and one of the most curious is found in the recent reaction in favour of paper as a substitute for glass. Paper formed naturally the earliest basis for photographic images, and, except for Daguerreotypes, continued to be so through all the experimental and practical stages of the art, until a quarter

of a century ago. It was not duly appreciated, however, and the use of a film of albumen on glass was regarded as a great improvement. When the collodion process was introduced, almost every one was jubilant over the enormous improvement in the art, paper was deposed from its position in negative work, and glass reigned in its stead. Even for positive prints, collodion and glass, had for a time a hold in photographic practice and public appreciation. For vignetting purposes, glass plates for many years held position, aiding in the production of offensively formal effects. Recently, however, a decided change has set in. Glass vignetting plates have been superseded by Mr. Wymouth's paper vignetting masks. A transparent paper covering for the negative, to receive retouching, was introduced by Mr. Crougton, the idea has been most ingeniously and comprehensively worked out by M. Lambert, and it is probable that the greater part of the retouching and modification negatives will receive in future will be upon such paper rather than on the glass negative itself. The paper read by Mr. Blanchard on producing enlarged paper negatives, and the examples he showed, have given another impulse to the use of paper in preference to glass, which Mr. Brooks' two recent papers on masking and paper negatives will accelerate. And finally, Herr Warnerke's method of using paper instead of glass in dry collodion work will probably effect a revolution in field-work, rendering the troublesome carriage of glass plates altogether unnecessary.

In most respects these changes are, we think, beyond question improvements. Retouching upon a sheet of transparent paper, like the *papier minéral* of M. Lambert, stretched evenly in immediate contact with the face of a negative, presents a better surface for retouching than the surface of the negative itself, is more easily modified, and is removed in a moment if unsatisfactory; whilst the same paper applied in like manner at the back of a negative admits of many effective touches, modifying the general effect of the picture, in the finished result, without suggesting retouching at all.

The mode of masking recently described by Mr. Brooks, in which both paper prints and paper negatives are employed for modifying defects, or securing artistic improvements, in a print, admits of a much more extended application than could possibly be pointed out in the limits of a paper read before a society. The light and shade of a picture may be completely modified, offensive portions may be removed, and new material added to secure pictorial effect; and this easily, and without risk of failure, if moderate skill and care be employed. For combination printing such paper masks and negatives present unusual facilities. The one imperfect figure which so commonly spoils a group may be taken separately, and added to the others in the negative without difficulty; and so with other subjects where optical or other causes render the production of a perfect negative of the whole difficult or impossible. The method of printing from two identical negatives, one superposed on the other, proposed some time ago as a means of securing soft, round, and artistic effects, is rendered easy by the use of a paper negative, which, placed at the back of the original glass negative, might be made to modify the result in almost any degree which might be desired.

In many cases the texture of paper well waxed is scarcely perceptible, and in many cases where perceptible it is not a disadvantage; but where it may be desirable to avoid it absolutely and entirely, Herr Warnerke's mode of preparing sensitive films presents a ready facility for obtaining all the advantages of the paper negatives, with the perfect delicacy and freedom from texture of collodion. His mode of building up a transparent film, firm, tough, and easy to handle almost as a piece of parchment, meets every necessity, and gets rid of the possible objection to paper in very fine and delicate subjects. Such a film coated with collodion-chloride of silver would give first a transparency, and

then a negative by direct printing, not requiring development; or, the film prepared for camera work, would, of course, with development, give the same result. For duplicate negatives, or for masks, or for combination printing, it is manifest that this sensitive tissue will answer all the purposes of paper, without even the trifling objections which some might bring on the score of texture.

THE ENGLISH ECLIPSE EXPEDITION TO INDIA.

[The following interesting letter has been received by the Berlin Society for Advancement of Photography from Dr. Vogel, who, it will be remembered, took part in the expedition at the invitation of the Royal Society, and who has already bitterly complained, in a previous letter published in these columns, of the imperfect manner in which the expedition was fitted out and organised. Our readers are probably aware that by reason of the unfavourable state of the weather, the tedious journey of the party of observers has been undertaken in vain, but they have not yet had any specific account of the expedition.—Ed. P.N.]

On the fate of the English Eclipse Expedition to the Nicobar Islands I have unfortunately but few pleasant words to say, and I must touch upon matters upon which I would rather be silent, had I not the welfare of future expeditions at heart.

I arrived at Point de Galle without accident. The journey so far, notwithstanding the terrible heat, was, relatively speaking, a pleasant one. The coasts were not new to me, but they were far from uninteresting. At Ceylon I saw quite a new world, tropical plants in all their wonderful development, and this view alone recompensed me a thousand times for all the troubles of this long journey. It was the first time I had seen the tropical vegetable kingdom in all its glory. Egypt has plenty of palm trees, it is true, but these appeared grey and dried-up against those of Ceylon; but it is not palm trees alone, but trees, bushes, grasses, and blossoms of the most luxuriant growth, that gladden and surprise the eye of the new-comer on every hand. The peep at Ceylon which I obtained is to me like a sweet dream or a pleasant souvenir, which will never fade from memory, for it was, so to speak, the first glimpse of sunshine upon my journey.

The expedition divided at Ceylon. Schuster went with Ladd and Beasley, the photographer, to Singapore, while I remained with Meldola and Reynolds at Galle, to await the gunboat "Enterprise," which was to have on board Professor Tachini, the Italian *astronomer*, who had been invited, and the Indian members of the expedition. These were, Captain Waterhouse, the chief of the Ordnance Photographic Establishment at Calcutta, and Dr. Pedler, the Professor of Chemistry at Calcutta College, who had left that city to join us on the 11th of March. On the 17th the "Enterprise," a small, but swift steamer, arrived, and on the 18th we started for the Nicobar Islands.

The news which our friends gave us of the Nicobar Islands were scarcely of a reassuring nature. The islands, we were told, were plagued with fever, and as a preventive against attacks we had a daily dose of quinine. We had no surgeon on board. This omission seemed to me a most important one, as we were in such an unhealthy locality. I was told that exertions had been made in Calcutta to get a surgeon to accompany the expedition, but that he begged off at the last moment; then there was a talk of touching at the Andaman Islands, where there is a military and penal settlement, in order to press a medical man into the service; but this was not done, and very soon we had to repent bitterly of not having taken such a step.

The accommodation on board the "Enterprise" was, to say the least, uncomfortable. The vessel was a small one, the best cabins had been secured by the gentlemen from Calcutta, and we were given a large space at the stern, which was to serve us as sleeping apartment. Articles of

property laid on one side for an instant were shifted and moved about by sailors, pursuing operations of one kind or another. Beds there were none, and we had to sleep on cushions, while the attendance provided left much to be desired. Sometimes we had no water, no towels, no soap, and our boots were seldom brushed. We were told that in India everybody had his own personal servant, and indeed the Indian members had each brought their bag; one might have guessed, however, that we Europeans, who had no experience of India, would have come unprovided with a servant, and indeed we had no opportunity of engaging one during the voyage. On the 23rd March we touched at the Nicobars, and then there arose another unpleasant feature of our journey. Professor Tachini's assistant was attacked with the smallpox. He was ill when we were at Ceylon, and had we had a surgeon on board he would probably have recognised the disease, and sent the patient at once on shore. Now, unfortunately, we had him on board; we were crowded in a small vessel with an infectious disease. On the island of Camorta, where we landed, there was a penal settlement, and here, by good fortune, we found a hospital attendant, who at once succoured our patient, but was unwilling to take him on shore. The position was a perilous one, and would have become more critical still, had not a gentleman named Roepstorff brought advice and assistance. He had been sent to the Nicobar Islands in advance, to make arrangements for the expedition, and he soon solved the problem. He sent the sick man on board a lightship, and in this way isolated him, both from us and from the colony at the same time.

M. Roepstorff was a Dane by birth, but in other respects quite a German, and it was a treat for me to be able to speak my mother tongue with him and his amiable wife.

To escape attack from fever we dared not sleep on land, but had to return every night on board ship. Unfortunately our precautions availed us little, for the captain and several of the officers, as also Tachini and myself, were smitten. Our station was upon a hill which had been freed from wood by fire and axe, previously, through the exertions of M. Roepstorff; and several bungalows constructed of bamboo and palm straw, to which a convenient footpath led, completed the arrangements.

It was the idea of the English originator of the expedition that we should divide, one portion of us going to Mergur, on the coast of Burmah, while the other remained at the Nicobar Islands. In this case, if one of the spots unfortunately experienced bad weather, the other might be more favoured in this respect. Unfortunately this plan was not carried out. All six observers remained at Camorta on one spot, and were placed in a *body hors de combat* by the same heavy thunder-cloud. Indeed, during our three weeks' sojourn at the Nicobars the weather was fit for anything but our purpose; and in choosing them as one of the stations a most unfortunate selection was made.

As I have already stated, the apparatus with which I was provided from England was very imperfect. The principal portions of it, two lenses, were mislaid in the most unaccountable manner at Ceylon; and so there I was, with my excellent spectroscopic, which, whatever its value, was of no good without a telescope. The hope that the Indian members would bring a spare telescope with them proved vain. One mirror-telescope of Poyson there was, but that Dr. Pedler required; and I had to console myself with the hope that some of the spare apparatus would fall to my lot when the occasion came. I was, although a guest invited by England, to content myself with the fragments that fell from the table of the rich. In the end I found a rectilinear lens of Dallmeyer's of three inches aperture and almost two feet focus. This threw a brilliant image of the sun about two lines in diameter. With the aid of a Chinese carpenter the lens was fitted at the end of a wooden tube, and in this way

a sort of telescope was constructed. At the other end of the tube the spectroscope was fitted so that the sun's image fell exactly upon the slit, and in this way I secured a most dazzling spectrum. The sun's rays were thrown upon a mirror by the aid of a lens, the former being upon a heliostat, and this, on being turned by hand, was made to follow the course of the sun, so that I could retain the sun picture for a long time upon the same spot. My spectrum apparatus of Schmidt and Haensch, of Berlin, was in capital order, and was certainly the best of all those that had been brought.

Meldola had a beautiful telescope of Lookyer's which threw an almost inch-sized solar image. The spectrum apparatus was, however, small, and only gave, with a quartz prism, a spectrum but two centimetres in length. Pedler worked with a mirror-telescope with a long spectrum apparatus attached, which did not, however, give particularly good images. Tachini confined himself to making ocular observations. Waterhouse wished to secure a picture of the corona itself, not the spectrum of it. He had provided himself with a rectilinear lens of thirty-inch focus fitted to a clockwork arrangement, so that he could follow the course of the sun.

The setting up of the heavy apparatus was a matter of some difficulty. They are first of all to be taken to pieces, corrected, and put together again. Many of the parts had been broken or put out of order during the journey. Then came the testing of the photographic chemicals, the handling of which at a temperature of 26° Reaumur was not agreeable. We had, however, no other difficulties besides the heat to combat. I employed gutta-percha covered plates, which kept exceedingly well, and which I can recommend especially for warm climates, because they obviate the polishing of the glass, which is rather distressing in hot localities. The plates kept, despite the heat and the damp, a surprisingly long time, and I could expose for fifteen minutes without getting any dry stains.

The collodion I employed this time was the ordinary collodion prepared according to the formula given in my manual. It is not necessary to have a collodion with a large proportion of alcohol. The dipping bath I acidified rather more than I do at home. I went to work industriously to take some landscape pictures, employing to some extent Wortley plates, and secured many pictures of the luxuriant Indian foliage. The dry plates which I purchased in England proved to be on the whole not bad. Several showed spots and patches, and others faint markings, but the majority yielded serviceable pictures, which were little inferior to wet plates. Of course it is necessary, first of all, to expose a dozen such prepared plates, and to develop them before proper experience of them can be acquired. As regards their price, a shilling a piece for "7 by 4½" plates, they may be recommended, and I repeat, so far as their sensitiveness was concerned, they were little inferior to wet plates.

Everything having thus been made ready for the 6th of April, that eventful day at last came. The day before we saw in the distance several waterspouts which seemed to bode no good. In the morning there were several clouds to be seen, and these increased in the course of the day. Tachini looked out for protuberances on the sun very early, and recognised a few. There are just now but few spots on the sun (the sun spots have a period of eleven years), and very few protuberances are to be seen. At twelve o'clock we could observe the contact of the moon against the sun's limb, and then came a dense cloud, and put an end to all our hopes.

The darkness at the moment of totality was not very great; it was about as light as at full moon, perhaps a little lighter. The failure of our observations is all the more to be deplored as the eclipse was of so long duration (four minutes twenty-two seconds), and such a good opportunity will not soon occur again, and the apparatus at my disposal led me to the belief that I might have

secured a satisfactory result. The apparatus which I had constructed was so powerful that I was enabled to secure, in a quarter of a second, a vigorous spectrum image of the sun. As the eclipse lasted four minutes, I could have secured an exposure 1000 times as long ($\frac{1}{1000}$ of a second), and this should have been sufficient to have obtained a spectrum even of so pale a phenomenon as the corona. Unfortunately, the best preparations were of no avail. We had undertaken our journey for nothing.

With the failure of our observations, our misfortunes did not come to an end. Just before the eclipse, the long-expected surgeon from Port Blair arrived, too late to be of much assistance. Our small-pox patient had got better in the interim. The surgeon dismissed him in fourteen days from the commencement of the disease, obviously much too early, and the infection spread to one of the sailors, who was banished to the lightship. A second sailor afterwards showed suspicious symptoms, and we could not, seemingly, shake off the infection.

After the eclipse there remained the disagreeable task of packing up our instruments again; in this we availed ourselves of the aid of the prisoners. Suddenly the governor of the island, Homfray by name, withdrew, for some trifling excuse, a portion of the labourers, and the consequence was that our work was lengthened, and our departure from the fever islands delayed. Finally, he shortened the hours of labour of those remaining to us, and took them away altogether one Sunday, although they were all heathens or Mahomedans. No doubt an energetic protest would have done something towards getting the labourers back again, and I recovered my men by these means. But our Anglo-Indians contented themselves with putting up with the inconveniences, threatening to represent matters later to the authorities, when it would little avail us. As a rule, scientific expeditions are treated by civilised nations with honour and respect. Proud England allows one of her minor colonial officials to worry and provoke a body of scientific men sent out from the mother country. As a characteristic of Mr. Homfray, it may be mentioned, that he gave it out that heaven had sent the clouds on the occasion of the eclipse, out of punishment to the astronomers, who were all atheists.

At length, on the 12th of April, we bade farewell to the unfortunate islands, and steered towards the Andaman Islands; we could not go on shore, however, for the sick sailor on board gave rise to suspicions, and we were placed in quarantine. On the 18th we landed at Calcutta.

PRINT WASHING.

BY PHOTO. CHEMICUS.

THIS subject, like the old man in Sinbad, still attracts the attention, and still exists as the bugbear and incubus, of photography; and the man who finds an effectual remedy to the evils existing will well deserve to have his name recorded as one of the greatest benefactors to the art. The most that can be said of the many suggestions that have been made is, that they in some degree mitigate the evil, but most certainly they do not cure it; and, heterodox as it may appear, we are much inclined to fear that a perfect panacea for the evil is as far distant as ever.

Our reasons for thus thinking are briefly these:—in the very clear and lucid editorial article on "Sulphocyanide for Fixing," the cause of its failure was very correctly explained—namely, that it was practically impossible to completely get rid of the last traces of sulphocyanide of silver. Now, we believe that this is the difficulty with which we have equally to contend in the use of hypo, and that we are, in a similar manner, unable to eliminate the hyposulphite of silver. Nay, more, we have grave doubts whether the latter is not more difficult of removal than the former, for the reason that the instant it is absorbed by the paper it at once comes in contact with a decomposing agent, viz.,

the traces of chlorine or acid which have been used in bleaching, and which obstinately remain in its texture.

Now, if this theory be correct, it follows that the instant a print is placed in the fixing bath, a minute portion of the hypo is decomposed by the chlorine, producing a corresponding amount of deposit of sulphur, either free, or else in combination with silver; in either case the result is the same, viz., the ultimate deterioration of the print by its oxidation.

But although we fear that this cannot be completely remedied, yet we much question whether it cannot be reduced to a minimum by proper precautions and a considerable modification in the present system of washing, and we were much pleased with the practical suggestion quoted at page 287 of a recent PHOTOGRAPHIC NEWS, and which entirely coincides with our own experience, "that length of immersion is of little avail, and that frequent changing of the water is everything." We believe that the first immersion, which simply consists in diluting the hypo, aggravates the mischief, and that decomposition occurs after the solution has been thus diluted more actively than while it is in a concentrated form. The practical lesson to be learnt, then, is, that the hypo should be washed away as rapidly as possible, the washing water being allowed to remain in contact with the prints scarcely for a single moment. We have tested this by experiment, thus:—A number of prints, corresponding to two sheets of paper, were placed in a large funnel under a tap; the beak of the funnel had a piece of india-rubber tubing, fitted with a pinchcock, attached. Water was then run in; a brisk rotary motion kept up in the funnel, and the water allowed to run away every time the funnel was full. This was continued for ten minutes, during which the funnel was filled and emptied about thirty-five to forty times. At the end of this time the prints were placed in a flat tray, and just covered with water and allowed to stand for two hours; the water was then drained off, and a few drops of weak solution of permanganate of potass added to it, and the same quantity to an equal measure of water. No difference was perceptible, and not the slightest discolouration took place in the water in which the prints had been digested.

We then took the same quantity of prints, rinsed them slightly, and then immersed them first for five minutes, next for ten, and so on, finally leaving them all night, and then again pressing and soaking for two hours; but, on testing this last fluid, it gave instant and unmistakable indications of the presence of hypo. We have also found by experiment that if prints are kept in the first washing water for any considerable time, the sulphur compounds are retained with the greatest obstinacy, and it is almost, if not quite, impossible to eliminate them.

The moral is to modify the advice given to American electors, "Vote early, and vote often," and to adopt it in the form of

WASH EARLY, AND WASH OFTEN.

ON A NEW AND ACCURATE PHOTOGRAPHIC ENLARGING PROCESS.

BY PROFESSOR ZEUGNER, OF PRAGUE.*

ONE of the greatest difficulties that the practical photographer has to contend with is to secure enlargements of photographs with the requisite amount of sharpness. The reason of this lies obviously in the faults which already exist in the original picture, which are not only enlarged, but even rendered comparatively greater, by the shortcomings of the enlarging lens employed. The aplanatic lens, which has been introduced in recent times, is the only one which is tolerably free from faults of an achromatic nature, &c., and this is not completely so.

The effect of the first source of failure is that a positive

lens unites the marginal rays of any object at a nearer point than the central rays. The correction of this defect with a negative lens is only possible in three ways:—1. When the aberration, by reason of the spherical form of the lens, is entirely removed. 2. When the aberration is almost removed, so that a portion of the aberration of the positive lens only remains (in this case the lens is under-corrected). 3. When the aberration of the positive lens is not only removed, but an aberration of the negative lens prevails to some extent (in this case the lens is over-corrected).

The accumulated aberration of the lens brings about a contraction of the picture; in an under-corrected lens, for instance, a straight line (*a*) is given as a convex line (*a'*), while an over-corrected lens would render a straight line (*b*) as a concave line (*b'*) [see fig. 1.]

It might perhaps be possible to find two lenses having opposite errors, but it is very unlikely that such errors in both lenses would be similar. Nevertheless, by employing two such lenses, it is possible to remedy any defects from spherical aberration. It may be shown by mathematics that by properly selecting the degree of enlargement, the two errors may be made to annul one another. The only way to obtain a faultless enlargement by

Fig. 1. the aid of two such lenses is to photograph in the first place with that lens whose error is greatest, and then to re-photograph with a second lens which has another and smaller error, but of an opposite nature. If, however, the errors of both lenses are to be compensated in the finished picture, an enlarged image must be obtained with the second lens, and of such a size that the second error is pronounced enough to compensate the first.

According to this, the correction of the picture with the second lens would involve an enlargement of the image. In most cases, re-photographing once, or at most twice, will suffice. To choose and find out two lenses with opposite errors, so that it may be known how far to enlarge with the second lens in order to secure a correct picture, is difficult to do by calculation, but it may easily be done by experiment. Firstly, the aberration of different lenses should be ascertained; and secondly, the amount of enlargement, or the proportion in which the opposite errors in the lenses correct one another, while at the same time the picture is enlarged.

The first experiment is very simple. Upon stiff and very smooth white cardboard are marked three or more little points, all of them diamond-shape, like those (fig. 2) given, 1, 0, 2, and these are put at some distance from the lens. The marks are first placed upright, and the margin of the lens is closed, so that only one-third the diameter of its aperture is acting, and the middle spot 0 is focussed as sharply as possible. Then the card is allowed to slant, as shown in fig. 3, so that 0 is still in the same spot, while 1 is nearer Fig. 2. the lens, and 2 more removed from it. As a result the two latter marks will appear out of focus, and if they do not appear sufficiently so, the cardboard must be placed more slanting.

If the middle portion of the lens is now covered so that only one-third of its diameter remains free (one-sixth on each side), then 1 or 2 will come into focus, and 0 will become blurred. If the action of the marginal rays is

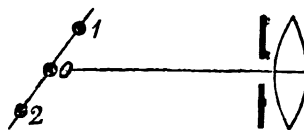


Fig. 3.

such as to render the nearer point 1 more sharp, then these rays have a greater breadth of focus than the central rays; the reverse is the case, however, if the further

* Read before the Royal Bohemian Academy of Sciences.

point 2 comes sharply into focus. On experimenting in this way with the lenses of various makers, two lenses may be found with opposite errors, and it is easily seen which has the biggest error.

To set fast the second point, viz., the amount of enlarging which has to be done with the second and less erratic lens, it is best to employ a test lens, having at one's disposal a row of fine blue points or lines gradually approaching each other more nearly, and photographing these from a particular distance; the image thus obtained is so far enlarged with the lens of less error until it is found that the points and lines in the densest part are separated. If, for instance, a straight line is photographed of one centimetre length, and it is found that all rows of points appear isolated by enlarging x times, this number x is noted, as also the distance of the camera from the rows of points at the time of photographing with the first lens, and the distance, besides, of the photograph from the other lens, and then in every other further enlarging, or re-photographing operations, the same distances should be observed.

When the first re-photographing operation of rows of points has been completed with care and attention, the operator possesses accurate data for the progressive enlargement of photographic clichés into perfectly correct pictures. The only condition to be observed is, that the image must be upon good patent plate glass, and the film of a perfectly uniform character, so that no defects may afterwards arise from inequalities of the glass or collodion.

It is of importance that the lenses employed should be fully corrected for chemical focus, as otherwise the focussing can only be undertaken with great difficulty. For this reason the author prefers to employ patent plate-glass and a lens of a comparatively long focus. The following advantages are in this way secured:—

1. Absolute achromatism of the picture, the coloured lines disappearing completely.
2. Reduction of the aberration on account of form to a minimum. In landscape pictures, the spherical aberration is, with equal aperture and focus, nearly nine times smaller for a concave mirror as for a lens.
3. Absolute coincidence of the optical and chemical focus.

Certain kinds of flint-glass are found to absorb the actinic rays in the same high degree as the optical rays, and thus lengthen the exposure, a matter of some importance in the case of instantaneous and astronomical photography.

(To be continued.)

SOME OF THE DIFFICULTIES AND PLEASURES OF LANDSCAPE, AS COMPARED WITH PORTRAIT PHOTOGRAPHY.

BY F. HUDSON.

THE difficulties of landscape photography are little known in all their intensity and variety, except to those who really experience them. Even portrait photographers, and those who occasionally run out with their camera to take a house or church, can have but a very imperfect appreciation of the worries which beset those who make landscape photography a speciality. Besides this, I am convinced that it is not so paying a department as the "studio." It is very seldom, if ever, the case, in the busy season, but that some good results are obtained in the studio—results that please the sitter and the photographer, and have a beneficial pecuniary result.

Of course, the difficulties are, in every particular, lessened in the case of small (as half and whole) plates, and it is only when large ones are attempted, that they present themselves in all their variety and vigour. For instance, in taking a view in which foliage is in the foreground, a movement in the trees through wind, which in a half-plate would be scarcely perceptible, would irremediably condemn a plate 20 by 16. One of my most suc-

cessful 20 by 16 pictures required the exercise of a patience and perseverance extending over a period of three weeks, waiting day by day, till an absolutely calm morning rewarded the effort.

I think *wind*, without a single exception, is the landscape photographer's greatest enemy. Of course, to those who photograph houses and structures of architectural beauty, an ordinary breeze is not of much consequence; but to photographers who seek out the best bits in a landscape, and aim, if possible, to bring in a beautiful tree in the foreground or middle distance, even a slight breeze means destruction to the negative. It is quite useless to attempt to render foliage as it should be, if there is the least wind stirring the leaves.

In large plates, also, another difficulty is, the much longer time required for exposure, for where ten seconds suffice for a half-plate, it will require sixty, or perhaps more, for a much larger size, and we all know that often—especially in gusty weather—foliage is absolutely still for the shorter period, while you may have to wait for a long time to get a whole minute perfectly calm.

Last spring I had some trying experience in this as well as other particulars. I was anxious to get a large negative of Shanklin Chine, and started with a friend to walk, leaving my "bus" to overtake us on the road. So we took it leisurely up the very steep and awkward hill of Bonchurch. We walked on and on till we walked into Shanklin, but no 'bus appeared. After waiting for more than an hour we started back to meet it, but met the "mail man," who told us that the horse (a hired one) had broken the trace, and could not get up the hill; that the 'bus was in the middle of the road; and that the man had gone back for a fresh horse and better harness. So we waited with all the patience we could muster, and at about nine o'clock—just as the "evening shades prevail"—the old horse came rattling along; and, after placing our vehicle near to where we wanted to operate, we trudged homeward on a four-mile walk.

Shanklin Chine has, unless in very dry weather, a very fair waterfall, which, of course, adds much to its beauty; but, owing to unusual dryness, it had shrunk to a mere dribble; so to secure a good fall of water we dammed the stream. The exposure for these large plates in the dark Chine required nearly half-an-hour, and to get water enough for that time required the exercise of a good deal of patience. We could not leave the door of the dam (a wooden one) in at night, for fear the boys would let the water off, or run off altogether with the door, so we had every morning to put in the door, fill up the crevices with clay, and wait. The weather being very dry, the stream grew less every day, till we had to wait for hours before water enough gathered to last sufficient time. We knew it was useless to leave home (which we did when favourable at eight o'clock) if there was the least wind in certain quarters; but frequently, when we felt sure (four miles away) that it was all right, we reached our destination only to find just wind enough to make a trial worse than useless.

One day there was only a very little wind indeed, and that affected only one tree; but that, unfortunately, was in the immediate foreground, and of a very sensitive character. Often, however, even this one would be still, and so we determined to try it; so we unshipped the 20 by 16 apparatus, carried it down into the Chine, and having posed it to the exact spot, having waited for the rising of the water to the requisite height, prepared the plate, put the slide into the camera, and having placed a man at the door of the dam up above, gave the signal to "let go." Down came the rushing water, but before a minute was over the breeze came, and the sensitive foliage began to flutter, and I telegraphed to my man above to stop it. So on went the cap of the lens, down went the door of the dam, and the water was stopped. After waiting, perhaps, ten minutes, a lull came, signal was given, and the water rushed down again; but this time, perhaps, not ten seconds passed before the leaves were all astir, and the water was again stopped. Well, for three mortal hours I stood by the camera, exposing and stopping, stopping and exposing, till I judged it had been exposed enough, and that my patience had had a pretty good trial. Of course, we lost a lot of the valuable water that could not be stopped in time, but I cared little for that, if the trees were all right; so, with all due haste, proceeded to develop. But alas! all had been in vain. A huge blotch in the midst of the tree, which looked a good deal more like a lump of cotton-wool than graceful leaves on a graceful tree, spoilt the whole, and that day and many others passed before I succeeded in getting a good result.

Sometimes the landscape photographer has to venture to rather dangerous places, requiring a considerable amount of nerve and

coolness to get what he wants. I remember having to stand on rather a narrow under ledge that overhung a cliff where there was but room for one to operate. You had to get down from the top of the cliff to the under ledge, much as you would step down from one stair to another, about five feet down, with the difference that if you took *another* step you would be dashed to pieces. I took off my shoes on that occasion (as my stockings gave me a better hold) and getting down, my man from the top handed me the camera, and after a good deal of difficult maneuvering I got a picture. This, however, could only be done on a calm day, as any wind with the focussing-cloth over your head made it rather dangerous. As it was you could not get round the camera to expose, but had to crawl between the legs of the tripod. While there a London gentleman came along, and called out, "I would not go down there for a hundred pounds!" to which I replied, "I should consider it very easily earned."

(To be continued.)

Correspondence.

URANIUM IN PHOTOGRAPHY.

SIR.—Colonel Wortley's characteristic letter in the last issue of the PHOTOGRAPHIC NEWS reminds me of the *dernier-resort* of "gentlemen of the bar," who, knowing that their client's case is a bad one, and having no evidence in his favour to bring forward, do their best to damage the evidence against him.

Colonel Wortley assumes that I was ignorant of the fact that nitrate of uranium was employed in *collodion* in the Wothlytype process. It so happens, however, that I was acquainted with Herr Wothly's process, for I read the specification in the Patent Office *before* it was published, and undertook the sale of the collodion, paper, &c., as soon as they were put into the market by the Company. If the latter fact has slipped out of Colonel Wortley's memory, it still remains in a ledger in my possession.

In the paper read before the South London Photographic Society I did not enter into a description of the Wothlytype process because I thought that photographers generally knew all that they could possibly wish to know about it. I had satisfied myself by actual experiment that it was useless to add nitrate of uranium to the printing bath. I knew how much time, patience, and money had already been spent and lost on the Wothlytype process, and I coupled, or wished to couple, the expression of my knowledge and experience on both points when I alluded to the worthlessness of the Wothlytype process. Perhaps it would have been better and more gratifying to Col. Wortley if I had said, "It is useless to add uranium to any of the photographic printing processes." That is my conviction, and that is the real meaning that I wished my words to convey. That I was justified in making those remarks about the worthlessness of the Wothlytype process is, I think, fully borne out by the following facts.

Firstly. The non-success of the Wothlytype Company in London.

Secondly. The collapse of the Wothlytype establishment in Paris.

Thirdly. The unsatisfactory experiences of Herr Kleffel in Berlin.

Fourthly. The non-adoption of the process by any eminent photographer in this country.

Fifthly. The non-practice of the process in any part of the world at the present time.

Sixthly, and lastly. The non-use of the process by Herr Wothly himself in his ordinary business. That, perhaps, is the most curious and remarkable fact of all, and I obtained the information from one who was two years in Herr Wothly's employ. The process was not practised professionally by Herr Wothly on account of its uncertainty and vexatious behaviour, both in his own hands and those of his employes. Herr Wothly is dead now, and I should think there is not another man living, excepting Colonel Stuart Wortley, who pretends to believe in the utility of

employing nitrate of uranium in any of the photographic printing processes.

Colonel Wortley appears to cavil at my phraseology. He does not grapple with the vital question, but attempts to ignore the fact that my "ideas" were corroborated by experiments; that the results of those experiments were laid before a number of skilled photographers and competent judges; and that the record of my ideas and the results of my experiments were not only unchallenged, but confirmed, by the members of the society who were present when the paper was read and the results exhibited. Had Col. Wortley attended the meeting, he would have seen examples of collodio-uranium prints both on paper and on canvas. The results of my experiments are still in existence, and may be seen by any one who is sufficiently interested in the subject to take the trouble to call at my place of business to examine them.

Controversy, however, on the Wothlytype question is neither desirable nor worth entering into. The chief point at issue is this: "Does nitrate of uranium added to the nitrate of silver bath give increased sensitiveness in the wet process?" I say it does not, and have made a series of honest and careful experiments to prove the accuracy of my statement. Col. Wortley had an *idea*, but instead of giving data to work from, or exhibiting a single evidence of his own success, he simply announced the bare idea to the Photographic Society, and magnanimously wished to saddle the Society with the cost, and the members with the trouble, of investigating the subject. The Society declined to appoint a committee of inquiry. I individually, and without any information from Col. Wortley, undertook the task of investigating the subject. The results of all my experiments were miserably disappointing. The experiments of others were not more satisfactory. The data of my experiments have all been published, and the results have all been exhibited. When added to the collodion, I found nitrate of uranium the reverse of an accelerator; in the nitrate of silver bath I discovered it to be a serious retardant; and in the developer I ascertained it to be a powerful restrainer in the wet process.

If Colonel Wortley has by any possibility discovered the addition of nitrate of uranium, *per se* or in combination with anything else, to be an accelerator in the wet process, why does he not publish his *modus operandi*, and substantiate his statement by producing evidences of his own success as openly and freely as I have exhibited evidences of my failures? Surely it must be easier for him to prove by demonstration and example that he is right, than, by mere words, to attempt to prove that I am wrong! Colonel Wortley is a gentleman, and the holder of a Government appointment, and cannot be actuated by the motives of a process-monger in withholding from the photographic world any of his photographic knowledge and experience. Having mooted the subject before the Photographic Society, the Society having declined to entertain his proposition to appoint a committee of inquiry, and individual experiment having failed to corroborate his statement, I consider that he is in honour bound to publish his formula, or in future maintain a judicious silence.—I remain yours, &c.,

11a, Berners Street, W., June 26th.

J. WERGE.

SIR.—The letter in your last issue, signed "H. Stuart Wortley," in regard to the use of uranium, containing marked and offensive imputations of ignorance on Mr. Werge, is in a way and manner that no "officer and gentleman" should have indulged in. Mr. Werge is, and has for some years been, well and generally known as one who has given many valuable and useful hints to photographers. If the Wothlytype was not *commercially worthless*, how came it to break down with such a skilled hand as the Colonel as chairman and principal director of the company?—Yours, &c.,

F.

THE NEW PATENT DOUBLE TRANSFER CARBON PROCESS.

SIR,—By your comments upon my former letter you seem not to have understood me. I should have said that I floated single or double transfer paper on a solution of lac in ammonia. Single and double transfer papers are usually understood among carbon printers to mean paper coated with gelatine, differing in the thickness of the coating and quantity of chrome alum they contain. If, then, Mr. Sawyer's patent is for a "flexible impermeable support with an elastic surface," what is the difference between the two? In the use of a different alkali to dissolve the lac, as far as I can see.—Yours respectfully,
 Boston, Mass., June 15. E. H. D.

[Our correspondent appears to have done what Mr. Johnson did and described; but we do not find Mr. Sawyer anticipated in his recognition of the special cause of a common defect in carbon prints due to the adhesion between an elastic tissue and an unyielding surface.—ED.]

NORTHAMPTONSHIRE PHOTOGRAPHIC SOCIETY

DEAR SIR,—Will you allow me a space in your News as regards a photographic society? We all know what a useful thing it is to belong to one, and the nearer the better. I propose starting one in Kettering, and calling it the Northamptonshire Photographic Society. I have elected myself as president. All photographers—professional and amateur—wishing to become members are requested to write as soon as possible to C. R. P. Vernon, Grafton Underwood, Kettering.—I remain, dear sir, yours truly,
 Grafton Underwood, Kettering. C. R. P. VERNON.

Talk in the Studio.

A NEW DEVELOPING HOLDER.—Mr. W. F. Stanley has just introduced a very simple and convenient developing holder, decidedly the best we have seen of many similar in principle. It consists of a handle, a wire support covered with ebonite, and a spring clasp formed by an india-rubber band. The same elements have been combined before, but not with such simplicity and efficiency.

THE BOUDOIR PORTRAIT.—This effective size of portraiture appears to be generally admired as filling a vacancy in the sizes and styles in existence. A clever writer in one of the cleverest satirical journals of the day, the *Maggie*, however, falls foul of it for some odd reason. In a trenchant article on the "Villainy of Novelty," he says:—"Sometimes, if nothing new is to be had, we are fain to be content with something old, altered, and called new. Fifth-rate photographers are clever at manufacturing this sort of thing. When they find that their natural skill is not sufficient to attract sitters, or to hold those that a generous chance has thrown in their way, they bring out 'something new.' Something of the sort is being tried at the present time. Business is perhaps dull, for we see 'the latest novelty, the New Boudoir Portrait,' advertised as something wonderful. We have seen this marvel. It is a photograph two or three inches longer, and about an inch wider, than one of those sizes that are generally accepted as quite good enough—when the quality of them is good enough—by most people. In all respects, except in this slight variation in size, it is exactly like what is called, we believe, the Cabinet Portrait, a kind that has been in use for years. Yet there are people who are silly enough to be taken with 'novelties' of this kind; but it is a degradation of art—true art should not condescend to fashion." Possibly photographers ought to be mollified by the recognition of "true art" as a possibility in photographic portraiture; but it is a fact which cannot be ignored, that fashion does especially prevail in all that pertains to human vanity, as portraiture must at all times, in degree at least. It has prevailed in painted portraits of various kinds. Fashion introduced the rage for card portraits, for cabinets, and in degree for other styles; and photographic portraitists generally

will doubtless be glad if an impetus to business is given by Boudoir portraits becoming fashionable.

PHOTOGRAPHS OF LAKE SCENERY.—We are favoured with a selection of very excellent photographs of English Lake scenery, produced by Mr. Payne Jennings, and published by Mansell and Co., who issue them in what they very appropriately term their "artistic series." The technical photography is excellent, and the art treatment, as evidenced by choice of view, of effect, of light and pictorial treatment generally, very satisfactory indeed.

To Correspondents.

J. W. (Bristol).—As a rule, the collodion best suited for producing positives is not best suited for producing negatives, and that best fitted for yielding good negatives is not equally well suited for positive work; but, at the same time, there is not usually such a specific difference between the two as the names might import. We have often produced good positives with negative collodion, and good negatives with positive collodion. If you had stated what was the nature of the fault in your positives produced with negative collodion we could probably have suggested a remedy. It is probable, however, that modification in other respects, without altering the collodion, will give you good results. Give a shorter exposure, and develop with a fifteen-grain solution of iron, to each ounce of which two drops of nitric acid have been added, taking care not to continue the development too long. If this fail, write again more fully.

H. C. COGSWELL.—Each of the pictures possesses some good qualities which the other lacks. No. 1 is not so well defined as No. 2, but possesses a little more vigour. Probably the choice between them would depend much on personal taste. Both would have been better if the background had been darker.

BLACK CLOTH.—There is no difficulty in applying a looking-glass—or, better still, Mr. Byrne's "Rectoprion"—to any camera for aiding in focussing. Herr Warnerke uses a piece of looking-glass, and connects it with the ground glass by gussets extending the proper angle at the sides to shut out light. It is a great improvement in focussing.

HORN.—A large number of the alleged spirit photographs have been proved beyond a question to be gross frauds, produced by tricksters trading on the credulity of foolish persons. We have examined a great many such photographs in which the trickery was most apparent to a technical eye, but which were accepted by spiritualists as undoubtedly genuine. We have rarely seen any in which the spirit image was sufficiently definitely made out to resemble any one, and yet, in many cases, they have been accepted as likenesses of deceased friends. The card you forward varies in some respects from spirit photographs generally. The features in the phantom image are sufficiently defined to be recognized as a portrait of the lady's deceased husband; but as he was a public man, of whom many portraits were published, it would not be difficult to secure such likenesses. The fact that the phantom image stands behind the figure of the sitter, with the hands resting on her shoulders, and palpably in front, is curious, and cleverly managed.

H. C. B.—We do not know at present whether Herr Warnerke intends to prepare his sensitive tissue for sale or not. It will be a great boon to photographers if he will undertake such a manufacture. We believe that Mr. Solomon supplies iodized paper.

MERCURY.—We have not generally found a tendency in the film to leave the plate when using the iodide of mercury intensifier, with which at one time we had considerable experience, and in consequence do not recommend it. If such a tendency be found, the use of a preliminary coating of dilute albumen would be the best safeguard.

B. A.—The arrangement of ground plan seems to be capital, and fourteen feet of glass in roof and side, facing north, will give good lighting. Frosted glass will, we fear, be too opaque for the side light; at any rate, it will be wise to use clear glass, and if it be found imperatively necessary to obscure some portion, you can do that subsequently with starch. Common Belgian sheet glass will answer well. Much depends on the knowledge and experience of an ordinary architect as to whether he will work out your wishes satisfactorily, but we should think you might safely trust to a capable man. Probably a builder who has had some experience in putting up greenhouses will be useful. To avoid risk of leakage it is important to give the roof a good pitch; and this is wise in all respects, as the rain then readily keeps the glass clean, as well as runs off instead of leaking in. Of course a good overlap in the roof panes is desirable, and let them be as large as convenient.

W. STURGEON.—The letter has been forwarded, and will doubtless receive attention. Several Correspondents in our next.

The Photographic News, July 9, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHS AFTER DECEASE.—PHOTOGRAPHIC MONUMENTS.— IODIDE OF SILVER.

Photographs after Decease.—In the melancholy task of recognising the victims of a calamity like that at Toulouse, or the wreck of the *Schiller*, photographic aid comes in most valuably. In the case of the Toulouse inundation, photographers from far and near were begged to lend assistance in taking pictures of the deceased, so that friends might be able afterwards to recognise the remains, and to know the place of their interment. It is perhaps the most horrible task that photographers can be called upon to perform, but unfortunately we cannot always leave alone what we do not like doing. A photographer can scarcely refuse to lend a helping hand on the occasion of such a catastrophe, and the fruits of his work are often the only material consolation which comes to the bereaved friends. It is work not only that cannot be shirked, but must not even be delayed, for it is well known that the faces of deceased persons alter for the worse within a day or two of their death. On the occasion of the railway accident that took place on Christmas day last, several special correspondents remarked upon this circumstance, and narrated how, on a first inspection of the dead bodies, most of the countenances had a serene and even a pleasant expression, which passed away, however, after a little while, giving place to one of pain and suffering. For this reason it is, that where photographic work of the kind has to be done, it must perforce be done quickly, otherwise the object is almost always defeated. Photographers in this country are unusually loth to undertake the production of portraits of deceased persons, but our Continental brethren are by no means so averse to such work, and in Paris one often sees the announcements about photographs being taken *après décès*. In the case of the wreck of the *Schiller*, where the drowned were washed ashore on the Scilly Islands, many miles from the mainland, identification could not, of course, be made by friends, many of whom resided in the interior of Germany and America, and for this reason the only reliable means of identification was afforded by photography. There does not appear to have been a professional photographer at St. Marys, but the lord of the manor, and the clergyman, who, it seems are amateurs, lent valuable assistance with their cameras, by rapidly depicting the bodies before interment. Instead of a name, the photograph of the deceased was in many instances placed above the grave of the unknown, until the other particulars could be obtained. There is nothing so distressing to friends as uncertainty respecting the death of a relative or acquaintance, and in securing a photograph of the deceased all this doubt and anxiety are cleared up, and proof is afforded, moreover, of the whereabouts of the remains.

Photographic Monuments.—While on this subject, we may remark that the custom of placing portraits of deceased persons over their graves does not seem to have found much favour. At the Cemetery at Shrewsbury several pictures of this kind may be seen, as also at the Paris cemeteries of Montmartre and Père-la-Chaise. In some of the village graveyards of Germany we have seen black outline pictures, or *silhouettes*, as they are called, and in Switzerland, at the village of Lungern, at the foot of the Bruinig Pass, the little churchyard is made ghastly by crude painted pictures on the upright boards which serve as tombstones in that spot. To replace the last named sketches, which when first executed by the village artist are no doubt bad enough, and which after a few winters' snow and rain are simply frightful to behold, photographs would be most welcome, and we have no doubt that ere now civilization in this form has already stepped in. Indeed, now that photo-enamels are becoming so perfect, and are not the rarities they were a couple of years

ago, there is no reason why portraits of this kind, in medallion form, should not be placed upon the stone, or neat iron cross, that marks a friend's resting place. A pilgrimage to the cemetery in after days would then call to mind much more vividly a remembrance of the dear friend we have lost, and make us at once realise the fact of his remains being there at our feet. It would be a fitting and happy application of photography, we cannot help thinking, for, however soon wind and weather removed his name and the particulars of his death, they could not rub out the features of our old acquaintance as we knew him. A score of years suffice sometimes to obliterate and render illegible any inscription upon a tomb, even when the letters are cut into the stone; but time would have little or no effect upon a photographic enamel.

Iodide of Silver.—Mr. G. F. Rodwell has published the results of some further experiments with iodide of silver, and among other statements he makes one which will hardly be accepted, unchallenged, by some photographers. It is to the effect that pure iodide of silver is scarcely affected by light at all, and that metallic silver or nitrate of silver must be present before the light can act upon it. Mr. Rodwell is evidently of opinion that when metallic silver is present—we presume under a film of the iodide—the former contributes to form sub-iodide, of which the photographic image is composed. Mr. Rodwell recognises, as our readers may know, three allotropic forms of iodide of silver: firstly, that existing between a temperature of 116° C. and the melting point (450°); in this state it is a plastic, tenacious, and amorphous substance of a reddish colour, and transparent to light. Below 116° it is a brittle, opaque, and crystalline mass of a greenish grey colour, although it assumes a yellow tint on being reduced to powder. Again, if fused and poured into water it becomes an amorphous yellow opaque substance of a very brittle nature. When iodide of silver is heated, the yellow colour remains unaltered until the temperature of 105° is reached; it then begins to darken, and from 105° to 412° it gradually passes through orange red into dark brick red. About 450° iodide of silver melts to a dark red liquid, and at a red heat it volatilizes and is decomposed. On cooling, the iodide gradually contracts until about 116°, when, curiously enough, it suddenly and violently expands, and passes from the amorphous into the crystalline state. Photographers have so much to do with this compound of silver that Mr. Rodwell's results cannot fail to interest them.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER IX.—(Continued.)

RETOUCHING

is a special branch for the artist, and can only be acquired by practice. It calls for the exercise of the most exquisite taste and discrimination, and, of course, a knowledge of the anatomy of the human face. If the operator be an artist, and possess these qualifications, there is no reason why, with practice, he may not excel as a retoucher to a greater extent than the artist who has not his knowledge of the negative; but it is those operators and retouchers who have not the proper qualification that have produced so many libels on photography and art.

It were well to have a print from the untouched negative, that you may the more readily see what is required to be done.

To prepare the pencil, cut quite a long point, then file the point on emery paper, finishing off on a piece of drawing-paper. This will give a point sharp as a needle, and the most delicate work may be done. To be able to work with this long sharp point proves that you have the *mechanical* skill requisite for retouching; your

artistic knowledge is proved by the use you make of this skill.

Look over your proof to see what imperfections are to be removed—hard lines to be softened, and dark shadows reduced in depth. With freckles, the work is done with the pencil, stippling them in to the density of the flesh. Do not attempt too much at a time, or you are liable to “dig a hole” in the negative. Holding the pencil lightly with the tips of the fingers about two inches from the point of the pencil, and working freely, you will find you get on better than by holding it tight and close to the point.

The Eyes.—Many retouchers take out the pupil of the eye with a needle point, and work in a catch light in place of the natural light. *Nothing, I think, can be worse*, as it gives a staring and unnatural expression. The negative (if good) of a sitter properly illuminated should give the eyes of proper tone, and with a good catch light, which at most may require strengthening a trifle.

The Nose may require straightening in cases where, thinning just below the bridge, the shadow is carried a little over the line, and gives the nose an appearance of being on one side. This must be done judiciously, and not to falsify nature. On the light side is a high light and a point of light at the tip of the nose; avoid making this a conspicuous white streak, as if the sitter was embellished with a streak of whitewash on that feature.

The Mouth.—The expression may oftentimes be lightened and improved by strengthening the light on the top of the upper lip, and especially towards the corner, thereby raising it and giving a pleasant expression. The shadows of the corners of the mouth are often exaggerated, and should be lightened, but by no means obliterated. The lips sometimes present a blotchy and broken appearance, which should be touched out. A light on the fleshy part of the lower lip, on that side to the light, should be also strengthened a little; but care must be taken to keep these diffused lights subordinate to the principal high light that they do not appear as lights speckled on at random to divert the eye from the main features, and to destroy the harmony and repose of the portrait.

Detail in the Hair, Beard, &c., is worked in with the lead pencil, and if this is not sufficient the brush with india ink must be used; but this work should only be attempted by the artist who has a perfect knowledge of drawing, or a painfully wiry appearance is given.

For Dark Shadows the stump is used, rubbing over with it the lead of the B pencil. Care must be observed that too much is not put on at first, as it cannot be afterwards removed except with pumice powder. When the lead has been evenly applied over the part to be retouched, finish with the HHH pencil.

Where a Sitter has Moved, and a blurring of the eyes has resulted, and the facial lines are doubled, a few judicious touches, obliterating shadows and putting in lights, will have a wonderful effect, but will not do everything.

A Few Words by Way of Caution.—The retoucher has in his pencil a wonderful power for good or ill. Do not abuse this power, but keep it within the bounds of reason, and make it subservient to the demands of art and truth. If the retoucher has a true artistic instinct, he cannot be otherwise than truthful, for the perfection of art is TRUTH.

PHOTOGRAPHY IN THE SOUTH.

BY DR. H. VOGEL.*

OUR summer at home often makes much work for the photographer, notwithstanding the pleasures of a superabundance of light which that time of the year brings with it; and these inconveniences of hot weather are to be met of a much more pronounced character in the

Tropics, when the thermometer registers 30° to 35° (Reaumur) in the shade. Under these circumstances the taking of negatives is not an agreeable occupation, for if the plate holds out, it is questionable whether the model will. It is certainly earning one's living by the sweat of the brow in the case of photographers out here, and if, therefore, the productions are a little behind our own up in the North, who can complain with any reason?

We have, however, seen photographs produced in the Tropics which reflect the highest honour upon photographers. In this category may be mentioned the productions of M. Schöff, of Cairo, in the Vienna Exhibition, and the pictures of Messrs. Shepherd and Bourne, of Calcutta, whose landscapes are very fine indeed. These show that the difficulties inherent to a hot climate may to a certain extent be overcome. From my own experience of course I know very well that when the temperature of the silver bath amounts to 26° to 30° Reaumur, any attempt at work is almost impossible. In Upper Egypt I could only work in the morning and evening hours, for in the middle of the day the plates came out of the bath quite blue, all the iodide of silver being converted into iodo-nitrate of silver, the films being quite insensitive. In this case it was only by cooling the bath that any relief came. To effect this, I had at my disposal nothing but wet cloths, and with these I enveloped my bath.

Indian photographers manage better, for they have a supply of ice at their disposal, which is easily obtained in all the large towns, and, provided with this, one need take little heed of the highest temperatures. Ice is made here artificially in large quantities, and there are at Suez, Aden, Bombay, Calcutta, and other cities, ice manufactories to be found. Another supply is imported into Calcutta from America, and even when a ship has half its cargo melted in transit, the owner still makes a good profit out of the transaction.

In general, the photographers of the South may be said to have made no inconsiderable amount of progress of late. The landscape pictures now offered to travellers in Egypt are indeed very fine, and when it is remembered that a print unmounted, measuring ten by eight inches, may be purchased for a shilling, it cannot be said that they are sold at exorbitant prices.

The circumstance that the photographs are sold unmounted is a great advantage to travellers. Mounted pictures are heavy, are difficult to pack, and are very easily torn or damaged. The photographer, on his side again, spares himself the expense of cardboard, which, after all, might not be to the taste of the purchaser; the shopman, again, reaps an advantage, for many mounts are spoilt by his customers' fingers, while mounted pictures, moreover, become sooner yellow when kept in stock.

For these reasons the sale of unmounted prints is a thing to be recommended by us at home. When I was in Aden, seven years ago, with the first German Eclipse Expedition, there was no representative of the photographic fraternity there, but in the interim a photographer has settled down in the place, a Parsee. He comes from Persia, and people of his kin are known in the East for their business capacities; in Aden and Bombay they have much influence upon European trade. The work of this Parsee was not very good in portraiture, but he had some very beautiful landscape pictures of Aden on sale, charging a florin for eight by ten prints. These latter were, however, not his own, but the work of an English captain, Elton by name, who is a skilful amateur photographer, and who has travelled these parts frequently. All these pictures were sold unmounted, and it was the same at Ceylon, where the prices charged were a little higher. At the latter place are already to be found the photographs of Messrs. Shepherd and Bourne, of Calcutta, who have sent assistants thus far to secure some of the natural beauties of the island.

Scarcely any other land has such magnificent scenery,

such luxuriant vegetation, as Ceylon. Wherever the eye wanders, there are the most charming Arcadian scenes to be met with. It is singular, therefore, that I did not see a single photographer on the island.

THE PRACTICAL PRINTER IN AMERICA.

XXIX.

SILVERING PLAIN SALTED PAPER.

THERE are two ways of silvering the paper, which are about equally in favour. The first of these, floating, we will here mention. This floating is done in the same way as the floating of the albumen paper, and, as is the case with the latter, there is also a certain side of the paper that is to be floated on the solution. This side is the finest grained side of the two, and to determine which is the one, take the paper over to the light, and by comparing closely the two, it can easily be told. The reason why the finest side is used is because the resulting print will be finer, and then again commercial salted paper is often salted only on this side. The time the paper is to be floated is easily learned by observing the results of differently timed pieces of the same sheet of paper.

It is a good plan for the beginner to cut a sheet of plain salted paper into four equal parts—i.e., quarter it—and mark on the back of one fifteen seconds, and on the others respectively twenty-five seconds, thirty-five seconds, and forty-five seconds, and float them separately for the exact time designated on the back of each. Commence to time each one of these pieces when the paper has thoroughly become flattened after it was breathed upon, to prevent it from curling over. Dry thoroughly, and fume them all the same length of time, not less than eight or ten minutes. If the ammonio-nitrate bath is used, far less fuming is required.

Print in the same quality of light, under the same negative, and to the same depth. Compare the result, and float the rest of the paper for the time specified on the back of the print which gave the best result of the four pieces.

The above is probably the best way for the beginner to learn, and after he has once learned it, he can in the future tell very nearly how long the paper should be floated, making allowance for the quality of the negatives, temperature, light, &c., &c.

In judging of the quality of the printed plain paper, so as to decide which is the best, there are a few things which we will mention that will, we think, guide the beginner a little.

If the negative is a fair one (which is about the one you should use in trying the paper), and the resulting print is "mealy"—which meanness consists in the presence of spots of various sizes, and also of a flat reddish colour—then the time of silvering is evidently not what we desire. These spots show more plainly in the shadows and draperies. If the resulting print is as just described, then the paper has not been floated long enough. This meanness can be very distinctly seen by holding the print between you and the light. The back of such paper remains as white as it was before it was sensitized, never being discoloured while printing on account of the heat, but only on account of its being improperly exposed to the light.

Then, again, if the paper is silvered or floated for too long a time, it will not have the reddish spots in the shadows, &c., neither will it be white on the back (for the heat of the sun will discolour it), but the paper will have a smutty appearance, as though the back of the prints had been exposed for a few seconds to the strong diffused light, and thus discoloured. Now examine the face of the two prints once more, and you will observe that the long-silvered paper will have a sunken-in appearance. This sunken-in appearance will, in a great measure, disappear in the final operations of the printer, but that is not the

object, for the object is to get it so that will be all right when it is just printed, and before it is toned.

We do not mean to say, however, that the above-specified difference of time given for floating different pieces of the same sheet of paper will give all of the above-given results, for in the case of long floating, which gives the appearance of the sunken-in print, the paper will have to be floated a minute or so to give this result.

The writer remembers one time of having occasion to use some plain paper in a strange gallery. As he had to use the paper that day, and being very busy with his other prints, he did not have the time to salt some for use, and upon finding some plain paper (which was not marked) he thought that he would use that, after having applied his tongue to the corner, and knowing that it had been salted. There were only two sheets of the paper on hand, and as he wished a full sheet, and being in a hurry, he did not wish to silver it either too long or too short a time, but as he suspected it was some of Clemons's, he thought that he would float it twenty seconds, especially after having asked the employer about how long he thought Mr. S., the former printer, had silvered his plain paper, and, although he could not tell for certain, yet he thought that it was about that time. He floated it twenty seconds, and after having fumed it, he placed it out to print, and upon looking at it next time, he found that the print presented a funny mottled appearance, familiar to the experienced printer, but to the beginner it may not be so. The paper printed in spots, i.e., some parts of it would print, and then again some parts had not shown the least signs of printing. Each of these dark and white spots were about the size of a pea. I floated the other sheet full thirty-five seconds, and I had the satisfaction of knowing that I had as finely printing plain paper as I ever saw.

Plain paper, when floated too long a time, will turn yellow in a short time, as for instance remaining over night, even in the month of October. Paper floated just right will keep two or even three days in excellent condition, even if the month is that of October.

The other way to sensitise plain salted paper is that which is known by the name of "swabbing the paper." Paper which is sensitised in this way turns yellow very quickly, so very much so that it is necessary in summer to delay silvering it until you will have time to print it up immediately, i.e., as soon as it is dried and fumed, as letting it remain for two or three hours before use will often discolour it like unto saffron. This can in a measure be avoided by placing the dark-box containing it in as cool a place as possible. The silver solution is more absorbed by the paper by this mode of treatment, than by floating, and consequently the heat affects it more.

The swab is made as follows:—Obtain a piece of wood about four inches long, one inch wide, and one inch in thickness. Take two or three square pieces of canton flannel, size four by four inches, and cover this block with it, having the napped side of the flannel out. This will give a



Fig. 1.



Fig. 2.

soft cushion to rub the paper with. (Examine figs. 1 and 2.) To prevent the stringy fibre from being left on the paper while sensitising it, I am in the habit of snapping well each piece of the flannel before fastening it to the block, to get rid of the loose cotton.

Fig. 3. The fine side of the paper is placed uppermost on a suitable size board; this board is covered with clean white blotting-paper, which presents a clean surface to the back of the paper. This board only needs to be an inch or two longer and wider than the sheet of paper, and when not in use it can be used as a covering for the whole-size

silvering-dish, in which the printing-bath is kept during the day.

The plain paper should be tacked to the board by galvanised iron tacks, and not with the common carpet tacks,

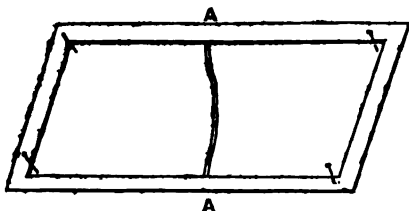


Fig. 3.

for the silver touching them will invariably cause a stain across the paper, running from the corner where the silver has touched the tack. About a couple of ounces of the silver solution is filtered in a small vial, and this vial is taken in the left hand, and the swab fixed conveniently in the right. Now pour a small stream of the solution across the width from A to A (fig. 3), and immediately attack it with the swab, and distribute evenly the solution over all parts of the paper until it has taken the liquid up. By drawing the swab evenly from left to right, and then from right to left, coming at times nearer, and then proceeding from you, you will thus distribute it equally over the surface. In the pouring on of the solution, try to regulate the quantity of liquid so that just enough will be poured on at one time; a half ounce being about what is needed. Fresh canton flannel should be used every day, but the flannel used in the morning will answer for the rest of the day's use. Canton flannel that has been used repeatedly is bad.

ON A NEW AND ACCURATE PHOTOGRAPHIC ENLARGING PROCESS.

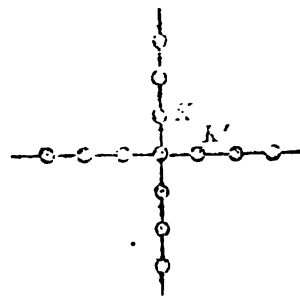
BY PROFESSOR ZEUGNER, OF PRAGUE.*

A VERY simple calculation, supposing the shape of the lens portions have first of all been carefully considered, will give the degree of the error, and its correction follows simply by combining a concave mirror or lens with a convex one. To re-photograph, in order to secure further amplification, it is only necessary to alter the distance of the lenses in the proper degree. The calculation shows that a corrected image is produced without an enlargement through the second lens, and of the size which the concave glass alone would give. The combination of lenses have, moreover, the advantage of producing an enlargement by means of only half the operations. It is therefore excellently well suited for enlarging photographic clichés, and will always give better results than an equivalent lens system.

One of the most important applications of this method of re-photographing would be to produce plans from landscape pictures by means of the Chevalier plane-table. As this faultless enlarging method requires no original cliché, its cost is very little; for a Chevalier rotating camera of large size is an expensive affair.

The application of the method of re-photographing to such purposes is considerably simplified by the following arrangement:—Let us suppose that at a suitable distance from the lens, and vertical upon its axis, are two threads crossing at right angles with equi-distant knots, as shown in the sketch at K and K'; these form a rectangular co-ordinate system which permit at once of the most accurate measurement of all horizontal and vertical angles.

Instead of this, a Steinheil cross-thread, or ocular-micro-meter, might be put up sideways, in the focus of a second



smaller lens, and thrown into the camera by means of a slanting plane-mirror, so as to be photographed at the same time. This dispenses with the employment of the very expensive Chevalier instrument, with its rotating camera or prism, as the surveying rods or signals may be used for adjusting the camera by hand with great precision, as the vertical middle-thread brings all the rods in a circumference of 360° into contact, one after another.

Another important application of the mirror-objective lens is in astronomical photography, where a combination of a spherical concave and convex lens is efficient in order to give serviceable and sharp pictures of the heavenly bodies by the re-photographing process. The author employs in photo-astronomy a $\frac{4}{5}$ inch parabolic reflector, of Browning's, supplied with a flat Newtonian lens, and mounted as a parallax instrument. At present the telescope is fitted with clockwork, in order to avoid the somewhat uncertain motion of the hand during long exposures. The size of the sun's image is, with a focus of 1.5 metre, fifteen millimetres, and, on re-photographing it twice with a quadruple Steinheil lens, the amplification amounts to almost ten diameters, and the image therefore measures one hundred and fifty millimetres, or nearly six inches. The Greenwich helio-photographic apparatus gives two and a-half inch sun pictures; but then the price of the parallelly-mounted telescope, with a three-inch aperture, corrected for actinic rays, is £1,800, while the Browning instrument of four and a-half inch focus, with photographic apparatus and ocular for enlarging to one hundred and fifty to two hundred and fifty diameters, costs but £22, or £44 with clockwork.

It should be remarked that the centring and fixing of a telescope of this kind must be very accurate, and is more difficult than with a refractor, as every angle-deviation is enlarged twice by reflection.

For sun and moon pictures this method of photographing should be very useful, as also for depicting the transit of planets. If, for instance, one possesses a photo-astronomical apparatus capable of giving a three-inch sun picture, and this is enlarged by the re-photographing method in two or three operations, amplifying five diameters each time, the original may be enlarged from 25 to 125 times, and pictures of the sun may be obtained with Venus upon it, having a diameter of 75 to 375 inches. Such pictures allow of measurement with an accuracy such as is afforded by no other instrument, and would permit of measuring images of the transit of mercury, which is of much more frequent occurrence than that of Venus.

The author presents as a proof of the accuracy of this method of re-photographing some pictures of the craters of the moon, the disk of the latter measuring from 36 to 110 inches, which were produced by the aid of M. Eckert, of Prague, after the enlargements of Mr. Brothers, of Manchester, of Rutherford's original photographs. In the 110-inch picture the lines and shadows are perfectly sharp.

* Continued from page 322.

HINTS ON RETOUCHING.*

The Hands.—Thus far we have but lightly considered any portion of the negative but the head and its surroundings. In full-length figures we must necessarily retouch the hands, and all previous rules appertaining to the quality of the negatives apply equally to the hands, not forgetting, however, that their light should be more subdued than that of the face. The correct form of the hand and fingers is all that remains then to be considered. We will start with this fact, that no one will object to the appearance of well-formed hands in their pictures, and it is not possible to materially change their outline. Therefore, any improvement in their modelling and texture is quite desirable, as the relentless camera is not so truthful to these members as to the face.

If the hands are darkly shaded, the veins and lines about the knuckles will be very strongly marked, and should be in almost every instance worked entirely smooth. A common error is often seen in the fingers being bent and shadowed so as to seem cut off at the second joint. This offensive shadow should be greatly softened at its edge, and each finger distinctly seen within it. In case of an appearance of blunt fingers, no account must be made of any portion of them except the slender line of light running parallel to them, and this, increased and brought to a point at their tips, will often give the desired effect. If the hand be moved, making several impressions, the most distinct one must be selected and made of a corresponding density to the face, bringing out each finger accurately, and making its outline more distinct. In the finished print the unnecessary impression must be entirely blotted out.

Drapery.

1. *Dark Draperies* seldom need our work, save, perhaps, to obliterate a fold that offends the eye, or to bring out more distinctly a pattern upon lace.

2. *White Draperies.*—It often occurs that the operator, in securing fine detail to white drapery, produces a negative that lacks brilliancy, and will produce a "muddy" print. In this case the retoucher has abundant work to do to produce brilliancy, and if well done he will be rewarded by a pleasing result. The materials to best effect these are these: a pliable, finely-pointed camel-hair brush, and india ink warmly toned with carmine or lake. Mix the paint about the consistency of cream, thinly laid upon the palette, but covering a large surface. Allow the brush to absorb this paint to its fullest capacity, then discharge from it the superfluous quantity by drawing it across bibulous paper until the brush seems quite dry and finely pointed. The reason of this is manifest: to obtain enough in quantity to allow of using the brush a long time without refilling, and of such quality as to preclude the possibility of paint drops following each stroke of the brush. When the brush is correctly prepared (and this is an important matter for so seemingly trivial a one), the details of embroidery or lace are to be heightened, improving upon what is already there, but never tracing a pattern that the negative does not contain. Make the figures as distinctly as necessary upon or near the bust, but allow both light and detail to lessen in descending.

Tucks should never be painted their entire length, but brought out distinctly in the light, allowing the negative to sufficiently render them in the shadow.

After due consideration has been given to this work, the larger folds and brightest lights of the dress must be made more brilliant. This often requires a broad sweep of the brush directly over the previous work, care being used, however, not to touch this a second time until quite dry.

The opposite style of negative from the one we have been considering shows the white drapery to be not only void of detail, but so thick as to be out of proportion to its surroundings. The detail can be supplied in the manner just given, but the great opacity is yet to be overcome. There are many methods given in our photographic works to do this, such as the use of a sun glass passed over the dress while printing; blue paint and other materials put upon the back of the negatives; slightly tinting the paper before printing (a very good plan if not over-done), and many others. The most practical method I have ever found is this: flow the back of the negative with collodion, to which has been added aniline (dissolved in alcohol) until a deep red colour is obtained. After this is dry, the outline of the dress must be traced, and a dampened cloth will easily remove the collodion from that portion designed to be made darker. Print by diffused light, and the result will, I think, be satisfactory.

Generalities.

1. Never allow the fingers or hand to touch the ground surface of a negative, as it will be very certain to destroy the "tooth."

2. If from any cause the "tooth" has been destroyed and the work is not completed, the varnish can be renewed upon the face by holding the negative for a few seconds over the fumes of heated alcohol. After drying, the surface can be reground and again worked upon. In all cases where it is desirous to make many prints from one negative, or a solar is to be made from a retouched negative, the varnish must first be treated in this manner, as it securely fastens the retouching, and obliterates many scratches.

3. *Dark Streaks* and spots in the negative, caused from chemical action, must be filled up by retouching.

4.—*Pinholes.* Many of the smaller ones can be touched out with the pencil; but for the larger ones we must use a brush well filled with paint, and quite dry. If too large a spot is thus made, the unnecessary paint can be removed after the work is dry.

5. Never consider a negative finished without first viewing it at a sufficient distance to enable you to judge of the entire effect.

6. Many negatives will admit of retouching without their surface being ground. Try them first, at least.

"Touching-up" the Prints.—Although this does not properly belong to our subject, it is so nearly allied to it that a suggestion will not be out of place here. The best material for the work that has ever come under my observation is the brown liquid found in a box of "Japanese water-colours" for albumen prints. It sinks immediately into the paper, does not spread, burnishes nicely, and cannot be observed in any light if it has been diluted with water. As it admits of no erasing, inexperienced persons will find a safe substitute in the use of "warm sepia," as prepared by Rowney and Co. It contains a small amount of gum, and only needs the addition of india ink to render it correct in tone and ready for use.

This closes the list of practical suggestions I wish to give you. Many things of importance to this work have been but casually noted. Still I trust the careful student will study well the ideas before he pronounces judgment upon them, and in every instance I feel assured he will find them easily applied and thoroughly practical. And now, but one word more to my friends the retouchers.

You have entered a field of usefulness that is but in its infancy—a sphere that yet remains to be developed, of which we know not its bounds. But certain it is that, like any new thought the world ever produced, "retouching" is liable to misconception and abuse. It remains now for each one of us to study our negatives as carefully as the masters of old studied their canvas or marble, and, by so doing, banish for ever the stigma which incompetency has cast upon this work.

The Photographic News.

Vol. XIX. No. 879.—JULY 10, 1875.

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DR. VOGEL AND THE ENGLISH ECLIPSE EXPEDITION.

Few persons could have read Dr. Vogel's communication which appeared in our issue of May 28th without deep mortification, as they must also have read his fuller narrative, which appeared in our last, with deep sympathy. The lack of apparatus and appliances, illness, great heat, general discomfort, being hindered, worried, and provoked by a minor Colonial official, and final failure in the most important respects, will afford reminiscences to a foreign *savant* of his invitation to assist England in a scientific expedition not of an enviable nature. In Dr. Vogel's first communication he says:—"My invitation came from England, and I was informed that instruments would be placed at my disposal. Judge of my surprise, therefore, when, on unpacking, I found nothing at my service but mere playthings. In the first place, I have no telescope, but only an ordinary six-inch lens, endowed with an awful focal difference, and without a camera. This lens, which is upon a stand, is to throw an image of the sun by means of a mirror which receives the sun's rays. The sun, however, is in motion, and the mirror ought, therefore, to be able to follow its path, if the image is to remain reflected upon one spot, which is a matter of course in photography. The mirror ought, therefore, to be provided with a clockwork movement; but there is none fitted to it. My assistant is to turn the instrument, it appears, and is to practise so as to do it accurately. Really one hardly knows what to think when one looks at the preparations that have been made. The two members of the expedition from England have, of course, provided themselves better; they have telescopes with clockwork and all kinds of perfections such as are necessary to the successful accomplishment of the difficult task we have in hand. I compare myself to the stork in *Æsop's* fables, that is invited to dinner by the fox, and finds itself unable to eat the broth set before him in a flat dish with his long beak, while the fox licks away at the repast with undivided pleasure. . . . The stupidity of the whole business is that the Astronomer-Royal in London possesses a suitable telescope, but he would not allow the same to be sent out, as the expedition is undertaken without his sanction."

On reading this extraordinary statement, we waited anxiously for the reply or explanation which must inevitably be made to the publication of such a charge. No authoritative answer has yet, so far as we know, appeared; but a correspondent in a well-informed contemporary supplies an explanation which, if not satisfactory, is curiously suggestive. The correspondent in question is a vigorous writer in the *English Mechanic*, under the *nom de plume* of

"A Fellow of the Royal Astronomical Society." On the first publication of the details of Dr. Vogel's treatment, he commented on the subject in forcible terms, remarking that "it would, however, be very important to learn from whom his invitation emanated, because whoever it was who asked an eminent foreign physicist over here to join a scientific expedition for a specific purpose. . . . and then left him so utterly in the lurch, deserves the most severe castigation that can possibly be conferred on him. I cannot, however, and will not, believe that the Astronomer-Royal was ever guilty of the paltry and ungentlemanlike impertinence of inviting a distinguished foreigner to join a British expedition, and then telling him that if he wanted instruments he must provide them for himself. Dr. Vogel, in common justice to everyone concerned, should have given full details as to *who* it was who 'informed him that instruments would be at his disposal.' . . . Undeniably 'the scientific credit of England suffers,' and suffers seriously, by such an exposé; but pray let us put the saddle on the right horse."

In the last issued number of the same journal, the writer in question remarks:—"With reference, however, to the Astronomer-Royal and Dr. Vogel, I have obtained some further information from a source which I believe to be quite trustworthy. I hear, then, that Sir George Airy was applied to to lend a telescope to the expedition, and expressed his perfect willingness to do so, *if any one would make himself personally responsible for the instrument*, adding, though, most righteously and properly, that he must decline to part with national property without such guarantee for its safe return. I can only suppose that he did this in recollection of the circumstances under which the Royal Astronomical Society lent some of their instruments to that rather impalpable body, the British Association Eclipse Committee, in 1871, and the way in which those instruments were presented to a certain Colonial astronomer without the knowledge or consent of the Society in any shape or way. After four years' waiting—and an unseemly 'row'—the R.A.S. has succeeded in recovering its property, but at the time Sir George Airy was appealed to the secretaries of the R.A.S. could get no replies to their letters, and it seemed in the last degree doubtful whether the instruments would ever be seen or heard of again. I can only hope that some honest and candid person will communicate these facts to Dr. Vogel, and that he himself will let the British scientific public know *who* it was who brought him over here, and made him a promise to be fulfilled by some one else who had never been consulted in the matter."

As one of the surest modes of letting Dr. Vogel and all interested in the question know the facts and the explanation, we print them in our columns, which are regularly read by our friend Dr. Vogel, to whom the explanation can scarcely be satisfactory, as it still leaves the fact that he was invited by England to take part in a scientific expedition, upon conditions which were not fulfilled, untouched, and implies distrust somewhere—distrust which, if it did not find a legitimate claimant before it arrived at Dr. Vogel, must rest injuriously upon him. The story to which the F.R.A.S. alludes circulated freely in scientific circles some time ago, but of its accurate details we can say nothing. In general terms, the story in question charged an English astronomer of reputable position with having made a personal present of certain instruments with the loan of which he had been entrusted, and the *mala fides* of an English astronomer has thus, it seems, been unluckily visited upon a foreigner whose interest in science had induced him to accept the invitation of English authorities to undertake an arduous duty, for the means of performing which they left him in the lurch. England, who sent the invitation, is an indefinite aggregate, and Dr. Vogel should, as the F.R.A.S. suggests, state who in England sent him his invitation and failed in completing the conditions, in order that the national courtesy may not be accredited with the laches of an individual.

FRENCH CORRESPONDENCE.

THE PHOTO-CHROMIC PROCESS IN COMMERCE—ANOTHER ENLARGING APPARATUS—JONTE'S POCKET CAMERA—ALGERIAN PHOTOGRAPHS—BERNOUD'S MARINE VIEWS—JACOBI'S PHOTOTYPE—LAMBERTYPE.

At the last meeting of the French Photographic Society, held on Friday, the 2nd inst., M. Leon Vidal exhibited the first photo-chromic print that had been produced in the special atelier which has just been fitted up in the office of the *Moniteur Universel*. The picture is a reproduction—I might almost say a fac-simile—of a painting by Marchette, representing a Spanish scene. The painting includes a large number of characters, clothed in the brightest of costumes, with great contrasts of light and shade, which make up a very striking picture. Now, notwithstanding the difficulties which the reproduction of such a picture would involve in monotone, M. Vidal has succeeded so admirably in reproducing it in every detail by means of his process, that the copy appears to have been produced by a painter with the aid of a brush rather than in any other manner. In exhibiting this fine production to the members of the Society, M. Leon Vidal called attention to a very curious fact, which was confirmed by all present. It was that a print in carbon, which he held in his hands, and such as is applied in the end to the sheet of paper bearing all the different impressions in colour, is absolutely absorbed by these latter in such a way that the finished print shows all the different colours without betraying a trace of the black print in carbon. Other works of a different kind are in course of execution at the Photochrome Atelier which is already in full operation.

M. Dérogy exhibited at the same meeting an apparatus destined for securing enlarged prints by means of sunlight or artificial light. In either case, the prints upon paper are produced by the wet process, but clichés upon wet collodion may also be obtained by means of a transparent positive. The maximum dimensions of these clichés are 90 by 60 centimetres, and they may be produced in a few minutes by employing a powerful oil or petroleum lamp. The apparatus to be used for the solar light is composed of a reflecting mirror of small dimensions (17 by 90 centimetres) of varying light mechanism, and a camera bearing the optical apparatus. The condenser measures 19 centimetres in diameter, and the whole forms an apparatus so very small that it may be easily placed at a window and manipulated with perfect freedom. To operate with artificial light, a second condenser must be used, and the source of light is enclosed in a lantern. In this condition the instrument may be utilized very well for projecting images upon a screen, as was shown by the results which M. Dérogy was able to produce the other evening before the members of the Society.

Recently a very large number of pocket instruments have been constructed to meet the wants of tourists and excursionists. First came the Scénographe of M. Plucker, then the Micromegas of M. Hermagis, then the apparatus of Bisson junior, and then that of M. Geymet. Now it is the turn of M. Jonte, one of our most skilful cabinet-makers. The pocket camera which the latter exhibited on Friday last to the members of the Society comprises a very little camera of bellows construction, a simple short-focus lens, a double dark-slide to contain two plates 9 by 12 centimetres, and, finally, a frame with ground glass. The whole is contained within a package measuring but 19 centimetres high, 12 broad, and 6 thick, the weight of the same being 550 grammes, therefore rather more than half a kilogramme, or one pound. The apparatus may be carried in the hand by means of a strap, or over the shoulder like a field glass. A folded stand upon a new system, without bolts, and with a moveable head, also fits up in a canvas case, being 5 centimetres broad and 68 long, and its weight 700 grammes. When open the stand

is 1 metre 30 centimetres high. Another package contains four double slides, with eight plates of 9 by 12; each of these frames weighs 25 grammes, making together 100 grammes. M. Jonte does not pretend to anything new in the construction of his bijou apparatus, but he has studied to make it as small and light as possible. Thanks to some very ingenious ideas, he has been enabled to produce a camera of this kind which is simple and solid, and which, at the same time, can be made at a moderate cost.

A Polish photographer, whose name I forget for the moment, presented to the Society a series of prints which excited a lively and just admiration. They represented types of the population of Algeria, which the author had collected during a sojourn in various parts of our colony. The portraits, treated in the Adam-Salomon style, form magnificent pictures, and reveal their producer as an artist of the first rank; it is, indeed, difficult to conceive how such pictures could have been produced in any studio which had not all the approved contrivances and fittings. And yet, as one may say, the pictures have all of them been produced in the artist's tent. All of the pictures are of large dimensions, printed magnificently by the silver process, and we could not but express our regret, which was shared in by those present, that the splendid clichés had not been printed in permanent pigment. In reproducing such pictures as these, the process of photochromie offers great advantages.

M. Bernoud, of Lyons, has sent us a large number of marine scapes and reproductions of paintings, which we have placed under the eyes of the members of the Society. They were viewed with much interest, and, beyond the eminent artistic qualities which they possess, they have the advantage of having been very rapidly photographed, so that where vessels are seen, every detail is sharp, and not a rope is out of focus. M. Bernoud has forwarded an album containing two hundred of these instantaneous marine views for exhibition at the Palais de l'Industrie. They will not be the least worth seeing of all the objects there exhibited.

I cannot resist a desire to mention the interesting specimens which I have received from M. Carlos Relvas, the eminent Portuguese amateur, which are the finest results of a process of phototype that he has just purchased from the inventor, M. Jacobi. The specimens I allude to consist of portraits, landscapes, and reproductions, the beauty of which is at least equal to that of the most perfect silver prints, and my esteemed correspondent affirms that the manipulations are everything that can be desired as regards simplicity of working.

Since I have mentioned some new processes, allow me to add, in support of what I have already said in respect to M. Lambert, that during the last fortnight the greater portion of the letters I have received, and which have emanated from the licencees of the Lambertype and Chromotype processes, are all of them full of terms of satisfaction in regard to those methods. My correspondents are surprised at succeeding so well with such simple means, and it may be well asked how it is that the carbon process has been so long making way in many of the studios. It is the same with the enlargements. I have just received from one provincial photographer the most flattering news respecting the production of pictures of large dimensions. Before Lambertype came into vogue, he could never succeed to his satisfaction, notwithstanding that he spent large sums in his attempts; but now he produces little else besides enlargements for his customers. It is with much pleasure that I register this success in favour of M. Lambert.

ERNEST LACAN.

RIDICULOUS INVENTIONS.

BY D. WINSTANLEY.

ANYONE who will take the trouble to "peruse" (as lawyers say) the book of abridgments of photographic specifica-

tions issued by the Patent Office,* cannot fail to be amused by the sheer absurdity of some of these "inventions," or the singular terms in which others are described.

In one, for instance, by a Mr. Power,† a substance is made use of which the "inventor" calls nitrate of "alcohol," and which he says consists of "spirits of wine, gunpowder proof." Another, by Mr. Claudet ("improvements" in stereoscopes),‡ has for its object the production of a "pleasing and novel optical illusion." One half of the stereogram "shows a person with his hat on," the other "the same with his hat off." The "improvement" consists of a mechanical arrangement by which the "pictures" are viewed alternately, and the "pleasing optical illusion" is produced by the figure appearing to take his hat off.

A similar "invention" to this last is that of Mr. Dean.§ The "improvement" in this instance refers only to the slides. "Portraits of gentlemen" are cut out and affixed by means of "wire, thread, gum, paste, or other adhesive or sticky substances" to a "shaft" running behind the stereo-picture, by which means a mechanical motion is given to the figures, which are "pulled at will up or down, backwards or forwards."

An invention having more exalted aims, by a Mr. Johnson,|| "relates to an entirely new system of photography," by means of which birds-eye views are to be obtained of "portions of the earth's surface." A balloon and "suitable windlasses below" are to be employed, and the camera pointed downwards from the car.

Another invention¶ proposes to rectify the distortion common in stereos of architectural subjects (the pincushion distortion, for instance?) by inclination of the bottom plate on which the views are placed; and still another** to give stereoscopic effect "to real objects" by viewing them with "one glass before each eye."

Still harping on the stereoscope, a Mr. Swan†† gives us an instrument with lenses "of different magnifying powers," which he uses in conjunction with pictures of different sizes. He mounts both pictures "in suitable positions" on one card (one ought to be some inches in the rear of the other to suit lenses differing much in focus), and by these means he gets his stereoscope in a form "much more convenient than that of the instruments heretofore employed."

But perhaps the most absurd invention of the lot (by Messrs. Earle and Barnes)‡‡ has for its object an improvement of photographic and other portraits, which is effected by cementing "*some of the hair of the person*" whom the portrait represents "in the position and after the natural manner of his hair." This improvement, it appears, is also applicable "to oil and other painted portraits, to enhance their effect" and produce a better likeness. It seems, also, that the "inventor" does not confine himself to authentic locks, but uses "the hair of any other person or kind" as well.

Ordinary inventors fare in this world "indifferent" well. Let us hope these curious efforts of unusual genius have met with their reward.

SOME OF THE DIFFICULTIES AND PLEASURES OF LANDSCAPE, AS COMPARED WITH PORTRAIT PHOTOGRAPHY.

BY F. HUDSON. §§

BUT landscape photographers have perils by flood as well as by field. Some years ago I was anxious to get a view of cliffs at Freshwater Bay, that could only be approached at extremely low tide. You passed through a natural archway of the rocks upon large masses that had fallen, which were partially submerged, leaving little irregular channels about them, with a foot or so of water. Covered with sea-weed, and constantly wet, this pathway

(or rockway) was very slippery; but with care, and holding on to the rocks overhead, you can pass through all right. Of course, with the camera on your shoulder, it won't do to be hurried. Well, we got through very well, and placed the camera, but the tide had already turned, and was coming in quicker than we liked, so we focussed, put in the plate, and exposed, which was rather long, owing to dark near rocks in shade. Exposure over, we took the camera off the tripod, man taking the camera and I the tripod. The sea by this time had nearly covered the rocks over which we had to pass. My assistant, who was an old man-of-war's-man, thinking sound bottom better than the slippery rocks, off with his shoes and stockings, rolled up his trousers as far as possible, and sturdily floundered through it, thinking a little wetting better than perhaps slipping, camera and all, bodily into it. As to myself, it was with the utmost difficulty that I escaped a "ducking," but, by using the tripod as a stick to steady me, and taking it rather slowly, I managed to escape with nothing more than wet feet and—a spoilt picture. My man's boots were floating about, but these he recovered.

These are only a few of the difficulties of an out-door photographer. How many times does he start out at early morning with high hope of bringing "something" good home at night: but the wind gets up, or the rain comes down, or mist arises, or the sun hides his face at the very time that his smile is wanted, and, after a weary day of anxiety, he returns home disappointed. And then there are other innumerable worries incident to the field that never enter the studio. Obligated to pitch your tent by the side of a dusty road, rain comes down on your camera and soaks it as well as yourself. Just when you are exposing, two or three ladies in bright colours walk leisurely across your field of view, or a wretched dog stands and barks at you; or, all at once, the screw breaks, and you have to tie your camera on to the tripod; or your focussing-screen gets smashed, and not another with you; or you begin to develop, and find, as I did once, the water with which you diluted it contained salt, and so you had chloride of silver swimming on your plate. All these, and a thousand others, never visit the studio. There everything is arranged almost before your sitters enter it; a chair, perhaps, or table, moved to the right or left, the camera (on wheels) reeled or advanced a few feet, or an alteration in the pose, being all that is required in, perhaps, the majority of cases. Even the light requires very little modification beyond the drawing of a curtain or two, and if there is a suspicion of the sitter's mobility about his head, a rest clapped behind his ears effectually fixes him as in "a vice." I know there are a thousand and one whims shown, especially with the ladies, about this collar or that cuff—or the mouth is either too long or "screwed up" too much—or (which they specially wish to avoid) they are "looking cross"—or the dress is too short—or the eyes are staring—or "the freckles show"—or, in trying to put on a bewitching smile, an idiotic smirk results, and, of course, they "never looked like that." But all these things are, by a little tact, conquered, and a step into the dark-room (instead of a hard trot of half a mile in a burning sun), and a cool and comfortable development, proclaim, with a minimum of both physical and mental effort, a successful result; and it not quite as successful as you wish, there is the very useful "retoucher," who, by an hour or two of judicious work, banishes all freckles, tones down those horrid wrinkles which are the dread of advancing years, strengthens the high lights, gives softness and beauty to the skin—in short, produces a thing of beauty that often both surprises and pleases the original beyond his fondest expectations. I think it must be admitted that the mental strain and physical exhaustion sustained by our brothers in the studio cannot bear comparison to that of those who labour in the field. It is the field that tries of what metal a man is formed. Many a man who is quite at home in his studio would be utterly disconcerted and soon used up with out-door work.

Of course there is the other side to this picture, but I have already exceeded my limits, and can only say a word or two of the "pleasures" of the out-door worker. In the work itself, it seems to me there is a delight of which the studio man knows nothing. It may be all very well to photograph and develop the faces of pretty children and others, but the face of nature is even more beautiful, and yields more pleasure when it "comes out" as it should on the plate, in the tent—the tree, the flower, the lake, or river, and the distant hill all add to its loveliness. And with what intense satisfaction and care, the beauty—coquette though she is—reput away in the box!—with what tenderness she is carried home, so that her very self can be almost indefinitely reproduced, to give a widespread and lasting pleasure to others!

To those who love the beautiful, it is no slight compensation

* 1862, price 8d. † 1862, No. 1196, page 20.
 ‡ Page 21. § Page 114.
 ¶ Page 123.
 ** Page 135.
 †† Page 142.
 ‡‡ Page 142.
 §§ Continued from page 323.

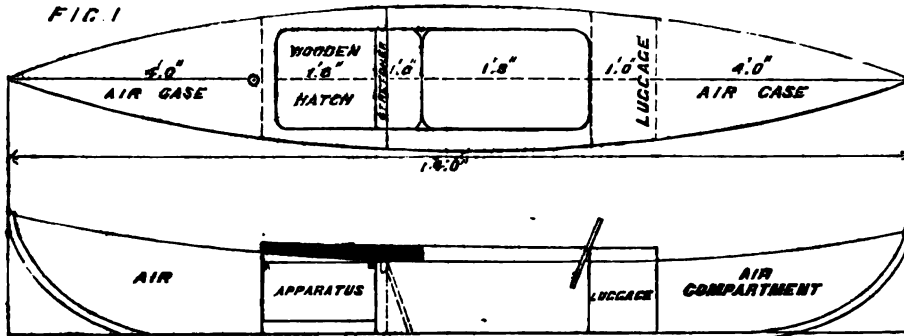
for all the worries and mishaps they undergo, to pass through lovely scenery, feasting their eyes on the stupendous cliff, the charming landscape, and the lovely summer sea. It is very delightful to wander through country lanes "when the flowers appear on the earth," when the primrose and the buttercup deck the glade, and the white and blue violet and the daisy are thrown broadcast around, when the birds hold concert together. I recollect listening to a concert of the birds once, when I was on a photographic tour, and lodged "in a cottage near a wood." The previous evening, at nine or ten o'clock, a nightingale here and there sent out a few delicious notes, but these were only the prelude to the grand burst of melody that heralded the approach of the glorious orb of day. At earliest dawn the sweet warblers were alert, and woke up the writer, who, obedient to the summons, willingly became an enraptured listener, while stream after stream of delicious melody and increasing volume filled the wood.

PHOTOGRAPHY IN A CANOE.

A CORRESPONDENT of the *English Mechanic*, who signs himself a "Medical Rover," contemplates a novel photographic excursion. He intends fitting up a canoe with photographic appliances, and so combining pictorial and aquatic pleasures. Here is his description of the outfit:—

"It is my intention in a short time to start upon a canoe cruise to Norway and the North and East, and as I am

going to do a little in photography at the same time, my equipment may interest your readers. The canoe is of the Nautilus type, and is built so as to take nearly all my apparatus. It is 14ft. long, and has a beam of 28in.; the stem is 1ft. 11in. high, and the stern 1ft. 7in. The well is the peculiar part; it is 6ft. long, and is covered by a hatch in two parts, one half being fixed and the other movable. Fore and aft are two air cases, each 4ft. long; the photographic apparatus is stored forwards, and the luggage aft. The well, as I have said, is 6ft. long, and has a combing of strong oak, 1½in. above the deck and 1in. below it; and, as this is the part on which all the strain lies, it must be strong, and well bound to the well by small carlins with a nail right through, and knees. It is further strengthened by an oak board, which extends from side to side for the ends of the stretcher to rest against. This well is covered over forwards by a wooden hatch 2ft. 6in. long and 1ft. 8in. wide, which is secured at the fore end by two thumb-screws and a catch, and at the other by a lashing; water-tight union is effected by having a piece of india-rubber tube let in and fixed to the top of the combing. The other part is covered by an ordinary mackintosh, the same as the Rob Roy. In this compartment, immediately in front of the stretcher, are two cedar boxes (water-tight); in the right-hand one



the camera and plates are stored, and in the left-hand the chemicals and other apparatus. Between them is a space in which the sails and mackintosh lie. My canoe is 2in. higher amidships than the Nautilus.

The camera stand legs stow away below the deck with the sails, and the other luggage is stowed behind the seat in a little cedar locker 1ft. wide. The sails are of the Nautilus type, and so are most of the other fittings. This was the canoe in its original form, but I have added a tent to it; and as I am somewhat dubious about its suitability, I will not describe it till I return.

The camera is only a very small quarter-plate one, with two dark slides; the bath is ebonite, and has a water-tight cover. All the solutions are in gutta-perch bottles except the collodion. They are as follows:—Developing, fixing, and intensifying, 20oz. each, and solid; soda, iron, and silver, also in gutta-perch bottles; the ether in tubes. The collodion is in four 2oz. bottles. A tin of methylated spirits, a bottle of varnish, &c., complete the bottles. In the left hand box, along with these (which are all fixed in a rack with round holes), are cloths and leathers, gutta-perch funnels, filter papers, sponges, developing cups of gutta-perch, tray of ditto for a sink, india-rubber tubing, plate-holder, and some other sundries. In the right-hand locker is the camera and triangle of stand, plate box and fifty plates, focussing screw and two backs, all fixed by blocks screwed down to the sides of the box; and in a separate compartment are two lenses.

I have had both air-cases divided in the middle, and fixed 4in. apart, so that I can stow various articles in the recess thus formed. When all on board, the canoe floats upon thus an even keel, but, if anything, a little by the

stern, as her beam is nearly amidships, and there is a cooking stove in the after locker. I hope, after having tried everything, to write you the result.

SOLAR NEGATIVES RETOUCED.

BY L. V. MOULTON.*

HAVING met with considerable success in retouching solar negatives, I submit a few suggestions, hoping that others will take the matter in hand, and give us a process that we may produce as fine results as from contact negatives; in which event I see no reason why solar enlargements should not supersede direct work almost entirely.

Those who have had experience with large contact negatives are aware of the difficulty of producing good work, on account of the lengthened exposure, which makes it almost impossible to secure large negatives of children, animals, and moving objects.

Some suppose that solar prints are necessarily coarse, having broad patches of high light, and shadows destitute of detail, being fit only for the artist to work upon. In my opinion, the same care and skill will produce work equal, if not superior, to contact if proper allowance is made in making the negative for the difference in the method of printing. Many do not seem to understand that a negative will print nearly or quite three times as dense in the solar camera as by contact; also that the deposit of silver should be much finer, and to that end the developer should be made weaker and used freely, to wash off a portion of the bath solution from the plate.

* *Western Photographic News.*

I am aware that many understand all this, and might reply that retouching has become a necessary part of negative making. That is undoubtedly true, and we must now learn to retouch the solar as well as the contact negative, or it will necessarily fail to serve for plain prints, and we must have our solar enlargements finished by the colourist to be presentable. Evidently the usual method of retouching contact negatives will not do, as varnishing is injurious; every little elevation in the surface acts as a lens, and makes a spot on the print. Grinding makes it almost equivalent to ground glass, and is fatal to good results. If not ground, every touch of the pencil will produce a white mark, whether any lead is left or not, the roughening of the varnish being sufficient; therefore the best results can be had only by preserving the matt surface of the silver deposit, and applying some substance in the form of a fine powder. I use graphite and no varnish, but I think it would be well to flow the plate with a weak solution of gum or gelatine, which would cause the powder to adhere better in the shadows, and render the negative less liable to be scratched. To apply the graphite, I first take a soft retouching pencil, and rub it upon a piece of paper till a polished black spot is produced; then cut some fine points from a soft "velvety" cork, and put them in the split ends of pencil brush handles, and with them carefully transfer it to the negative.

Correspondence.

REPRODUCING NEGATIVES BY THE POWDER PROCESS.

SIR,—Will any of your readers who have tried Obernetter's plan of reproducing negatives tell me how they coat the plate with the solution to make it flow evenly? I cannot manage it, as the repulsion of the glass is very great, and I cannot make it smooth.—Yours, &c., R. B.

URANIUM IN PHOTOGRAPHY.

SIR,—I certainly did assume Mr. Werge to have been ignorant that the Wothlytype process was a collodion one, as he spoke of the inutility of adding nitrate of uranium to the printing bath in the Wothlytype process. It now appears from his letter in your last number that it was a misstatement, and not want of knowledge. It is of no advantage discussing this matter. And with regard to Mr. Werge's statement that, had I attended the meeting, I should have seen unsatisfactory collodio-uranium prints done by him, I must say I fail to see what I should have gained, as I already see by his writings that Mr. Werge is ignorant of the correct uses of nitrate of uranium, under which circumstances, of course, his work is bad.

With regard to the addition of nitrate of uranium to the silver bath, the only occasion I mentioned it was casually in my paper; and I am bound to say that I consider it an act of grave discourtesy on Mr. Werge's part to pronounce himself on the matter without asking me for a definite formula, or if I had any recommendations to make. And he would have done well to have addressed the same question to Captain Abney, who, in his instructions to the workers on the transit of Venus expedition, points out the increase of sensitiveness gained by the addition of nitrate of uranium to the negative bath. Had Mr. Werge taken this course he would have avoided the exposure of the singular error he has made.

Mr. Werge alludes in his last letter to the "motives of process-mongers." Would he kindly explain what "process-mongers" are? It is a new word, and requires explanation, which I shall be glad to see from Mr. Werge in your next number.

There is nothing more in Mr. Werge's paper on "Ura-

and its Uses" that I think I need notice. It is merely a record of what he himself has failed to do, and entirely ignores the labours of others; in fact, to read such a paper before a learned society makes one exclaim, after reading it to the end, in the words of a well known poet:

"Parturiunt montes, nascetur ridiculus mus."

Yours truly,

H. STUART WORTLEY.

SIR,—Seeing that some doubt has been cast upon the conclusions deduced by Mr. Werge from the very complete series of experiments carried on by him to ascertain whether or no any increase in sensitiveness was obtained by the addition of nitrate of uranium to the silver bath, I send you a brief statement of my experience on the subject.

I made up a bath containing thirty-five grains nitrate of silver, and ten grains nitrate of uranium per ounce, iodised in the usual manner by the addition of iodide of potassium, and to this solution carbonate of soda was added until a permanent precipitate of carbonate of silver remained undissolved after violent shaking. After standing about twelve hours with occasional agitation, the whole was poured into a filter, and the bath allowed to filter through the deposit. Having thus ensured the complete removal of any trace of free nitric acid, I sensitized with it plates coated with Mawson's collodion (iodised twelve hours previously), and found it gave clear pictures without the addition of acid, and was even in that condition considerably less rapid than an ordinary slightly acid bath of the same strength, but without uranium, against which it was tested.

Having thus satisfied myself on the only point in Mr. Werge's most conclusive experiments about which any possible uncertainty could exist, I feel that any hope we may have entertained of shortening exposures by the help of nitrate of uranium employed in this manner must be abandoned, and that the less we have of it in our baths the better.—Yours truly,

R. W. ARTHUR.

AUTOTYPE AND CHROMOTYPE.

SIR,—As there seems to be some little confusion of ideas as to our allowing the use of the Autotype Patents to the licensees of the Lambertype and Chromotype processes, permit us to say that we have done no more for the said licensees than we have always done for the profession generally, viz., to allow the free use of our patents (except for the production of works of art) on the sole condition of the purchase of the materials of ourselves. We recognise in M. Lambert's processes some improvements, very many ingenious ideas, and a method of printing which may, perhaps, be worked out to commercial and practical purposes; we are anxious to aid these efforts by the production of suitable tissue, by the supply of apparatus, &c., and we shall always strive, as we have hitherto striven, to make the printing of permanent photographs practicable.—Yours very truly,

SENNOR, SAWYER, BIRD, & Co.

THE LAMBERTYPE PATENT.

SIR,—No doubt there are many others like Mr. S. Fry, desirous to know what Mr. Lambert "claims as novel in his patent for enlarging." If they apply at the Great Seal Patent Office, 25, Southampton Buildings, Holborn, as I did, they can get the specifications for fourpence each, by quoting the numbers, which are 1634 and 3633. These will give them not only what Mr. Lambert claims, but a description of "the nature of the invention and the manner of performing the same," though I should think, after Mr. James Hughes' letter in your last issue, this is perfectly clear to most photographers who have learned the photographic alphabet.—I am, sir, yours faithfully, CHARLES KNIGHT.

Ryde, J. W.

[The specification will be published in our next.—E.]

type, and will be published in

SULPHUR AND NITRE LIGHT.

SIR,—Seeing mention made in the News of what is called Mr. Spiller's discovery of the "Nitro Sulphur Light," puts me in mind of an experiment we used to try when school boys, which was to put some powdered nitre in the bowl of a common clay tobacco pipe, and hold it in the fire until the nitre had melted; then drop into the bowl a small piece of stone brimstone, which instantly gave a most brilliant white light, too dazzling for the eye to rest upon, the light continuing until the piece of sulphur was consumed. Since I have taken up with photography it has often occurred to me whether this light could not be used for enlarging purposes, but I could not see a ready means of getting rid of the fumes that are given off during combustion; but then the same objection might apply to the magnesium light.

Anyone may become convinced of the intense power of the light by trying the above simple experiment, but the nitre must be in a thoroughly melted state before the piece of sulphur is dropped in. Would it not be possible to construct an apparatus for burning the light, with pipe to convey away the fumes, as with the magnesium? Or some method might be used for condensing the fumes as they are evolved. We should then have an artificial light at our command, very little (if any) inferior to the magnesium or lime light, and at a tithe the expense.—Yours, &c.,

THOS. B. LATHMORE.

[Your boyish experiment would give a light of a similar character to that shown by Mr. Spiller, who did not devise a new light, but proposed a new application. The smoke is much less in quantity than that emitted by magnesium for a similar quantity of light.—Ed.]

THE REJLANDER MEMORIAL FUND.

DEAR SIR,—It is proposed to wind up affairs connected with this fund on the 17th inst, and I ask permission, therefore, to inform your readers, who have not yet subscribed, but intend doing so, to be good enough to forward their donations to me at once. Between two and three hundred pounds have been received, or promised, and the committee confidently hope that in the end the fund will not fall short of the last-named sum, there being, no doubt, several friends of the late Mr. Rejlander, and admirers of his genius, who are anxious to send a contribution before the list closes.

May I ask those who have promised, but not yet paid their donations, kindly to forward them as soon as possible?—Faithfully yours,

H. BADEN PRITCHARD, Treasurer Rejlander Fund.
Royal Arsenal, Woolwich, July 6th.

Proceedings of Societies.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The first trip of this Society was such a success, and so many expressions of satisfaction on the day's pleasure were echoed at the last monthly meeting, that a second out-door photographic ramble was agreed upon; and, consequently, arrangements were made for a tour up the Hebden Valley on the 24th ult.

The Hebden Valley is likely to occupy a conspicuous place in the photographer's guide book, should one ever perchance be published. The valley is regarded as the Switzerland of England. It has its range of mountains, its rugged peaks, its mill dams, its weirs, its waterfalls, its nooks and corners for the stereo. camera, its wooded hills and distant effects for the long focus lens—in fact, Hebden Valley is a paradise for the photographer. There he may feast to his heart's content, and drink in every sort of bliss that the "beer and albumen," or a "Howard tent," is capable of affording him. If he be the happy possessor of a tent that "holds everything, and just weighs 100 lbs.," or has a favourite corn or two, he should leave them at home; for the "improvement committee of highways" have not yet smoothed the path for the man or beast of burden that is likely to go in quest of the

grand and beautiful. Hebden Bridge is near Todmorden, on the borders of Lancashire, but in the county of York, and only eight miles from Halifax.

The morning was fine and inviting in every sense but the photographic. The wind disturbed the composure of the foliage to such an extent that the votaries of both wet, dry, moist, and all other processes, regarded the "refreshment" portion of the day's out as the most likely to turn out successful. Yet, notwithstanding the unphotographic aspect, the wet, the tannin, the beer-and-albumen, and the emulsion processes had each its representative amongst the party. The afternoon became overcast, and a sort of photographic "insolvency" pervaded the whole aspect of the beautiful valley.

The party sat down to tea at the "White Horse," Hebden Bridge, at eight o'clock; and, as many of the gentlemen intimated their intention of doing better with the ham-and-egg plates than they had with the tannin, a "comfortable" hour was spent in thoroughly testing the capabilities of the former process. After this pleasant repast the company returned home.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held on Tuesday evening, the 29th ult., at the Free Library, William Brown Street, Mr. W. ATKINS, Vice-President, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. J. A. FORREST gave a description of several useful photographic apparatus which he had seen during a recent tour. He also strongly advocated the retouching of landscape negatives, instancing some large negatives which had been seen by the Society, but which were now so improved by artistic retouching that he could scarcely believe the new prints were from the old negatives.

Mr. PHIPPS mentioned that to touch up small negatives involved a great deal of time, and also artistic skill.

Other members thought that retouching would have a tendency to careless manipulation instead of excellence in the original negative, which they should strive for. When necessary, natural clouds could be got by double printing.

Mr. FORREST exhibited a print, by Mr. Pettitt, of the "Setting Sun," as an example of what could be done by double printing.

A communication from the Rev. J. D. Riley (who was unable to be present), relating some of his experiences in making emulsion, was read by the Secretary.

Mr. TYRER exhibited several 12 by 10 negatives of Buildwys and Much Wenlock Abbeys, taken on the last excursion. He said there was plenty of work for a day there.

Mr. WEBER showed a number of prints of horses and cattle taken by him on Kennett's rapid gelatine plates. Both horses and cattle had been perfectly still, showing the capabilities of these plates for such work. He (Mr. Weber) in reply to several questions, said that though taken in dull morning light, the exposure had been almost instantaneous, the lens being capped and uncapped as quickly as possible. The attention of the horses was attracted by a man behind a bush beating a can with a stick.

A special meeting of this Association will be held on Tuesday, the 13th instant, when a demonstration of the autotype process by Mr. H. Taylor will be the attractive feature.

Talk in the Studio.

IDENTIFYING BY PHOTOGRAPHY.—In a case which was tried at the Middlesex Sessions, the jury were asked to decide upon the identity of a prisoner by means of a prison photograph. Although it represented him without the moustache which he wore in the dock, the foreman caused him to stand in such a position that the other jurors had no difficulty in recognizing him, and in consequence of previous convictions he was sent to penal servitude for seven years.

HERMAGIS' ENLARGING STEREOSCOPE.—In answer to the inquiry of a correspondent, Mons. Lacan informs us that the stereoscope, with a system of lenses for presenting photographs life-size invented by M. Hermagis, costs 200 francs.

COPIING OIL PAINTINGS.—A "Little Photo" writes: "I see that one of your correspondents is inquiring how to photograph an oil painting. When every dodge I could think of failed with me, I succeeded by holding a bit of light blue glass close to the lens; it changed the orange tone of the varnish to black, and with a good exposure I got it. If you make a note of this it might be useful to your correspondent."

EXPOSING BY ELECTRICITY.—Sir David Salomons, whose method of signalling on railways we recently noticed, and several of whose inventions in scientific apparatus, &c., were exhibited at the conversazione of the Royal Society, has devised an electrical attachment to a photographic camera, by means of which the photographer, having arranged his apparatus, can retire to a point of vantage, and when a suitable scene is presented can immediately photograph it. There are many situations in which the appliance will be found useful, as the charm of a picture is often lost through the "sitting for it" being too apparent. The details of the method are not yet published.—*English Mechanic*.

To Correspondents.

GLACIAL.—The extent to which the intensity of a negative is modified by varnishing varies very much with circumstances. Some varnishes penetrate the film more readily than others; but the chief difference is in the character of the negatives. In some negatives the film and deposit are very porous and spongy, readily absorbing a large proportion of the gum resin in the varnish, and in such cases the opaque deposit becomes semi-transparent, materially reducing the intensity of the negative. In other cases, when the film and deposit are firm and unabsorbent, the varnish dries as a glossy coating on the surface, without permeating the substance of the image, and in such cases the intensity is not appreciably reduced. As a rule, a spirit varnish with a thick body reduces the intensity of a negative most. A second coat of varnish has often the same effect. Printing in the sun will often give soft prints with an over intense negative. The intensity may also be reduced by long continued action of tincture of iodine on the varnished negative.

A. Z.—The blinds best to be kept closed, and those best opened, will vary with circumstances, especially with the class of heads. For instance, with a soft smooth-skinned small-featured person, a comparatively small space of open glass, near to the sitter, will give the boldest and most vigorously defined image; whilst with an old wrinkled face, larger space of glass more in advance of the sitter will give the best results. In the latter case the light is required to penetrate the furrows and wrinkles, so as to soften them. As a general rule, with a good light, about six feet of side and top should be kept covered at the sitter's end of the studio, and then about 10 or 12 feet of clear glass top and side will give good results.

LANDSCAPE.—The prints in cabinet photographs generally measure 5½ by 4 inches, some photographers preferring to make them 6 by 4 inches. We cannot speak from personal experience of the covering qualities of the lens in question; but as it only professes to cover 5 by 4, it may possibly fall short at margin in cabinet pictures, unless well stopped down. 2. The sharpness of an enlargement depends much upon the sharpness of the small negative. If a quarter plate negative be perfectly sharp all over, it will generally yield a 10 by 8 enlarged negative, quite sharp enough for pictorial purposes. 3. The meaning of the allusion to stops is simply that the smaller the stop the more perfectly the lens will define to the edges.

T. S. HICKS.—We suppose that the letter had been sent unstamped by mistake. We strongly deprecate the intrusive habit of writing private communications to gentlemen whose work has been noticed in our columns, or who may have contributed to our pages. To expect a photographer to send copies of work so noticed, to every one who may apply, is unfair in the last degree, and we should feel no compunction in not noticing such communications. Thanks.

L. S. C.—We are much interested in and pleased with your views of scenery, which is very familiar to us. The most picturesque is that looking down the river, with the church in the distance. The chief general fault is the bald whiteness of water and sky, which is chiefly due to the character of the light in which they were taken. This might be remedied by printing in some delicate clouds from a cloud negative, or by giving a slightly graduated tint to the sky by sunning. Possibly printing slightly deeper might be an improvement, as in some of them there is indication of detail in the water which deeper printing might bring out. In that entitled river view, with a tower in the foreground, the camera has been too near to the foreground, and focussed on the middle distance, so that foreground objects are least perfectly defined—a thing which should, as a rule, be avoided. We indicate these possibilities of improvement without finding fault with the pictures, which have many good qualities, besides being interesting in subject. In packing photographs on a roller you will find it a good plan always to roll the albumen side outwards, as the pictures can be much more easily made to lie flat after such packing than when rolled with the albumen side inwards.

D.—We presume that you will only obtain facheins of a manufacturer of aniline dyes. The paragraph which we published half a dozen years ago was, as stated at the time, from a foreign source, and could not be readily verified now.

RECEPTION.—The reception, or any attached mirror, would necessarily require to be removed from a folding camera when folded. So far as we can see, no focussing cloth need be used, if the side of the angular space formed by the mirror and ground glass are enclosed. Mr. C. E. Elliot, of Jewin Street, is agent for the reception. See his advertisement in our last YEAR-BOOK.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR JUNE.

BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven, 36 feet above sea level.

Date.	BAROMETRIC PRESSURE.			TEMPERATURE.			Direction of Wind at 9 a.m.	REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1 30-10 30-17 30-15	36°	66°	56°	S.	Fair and sunny. Very fine.			
2 30-13 30-10 30-06	57	70	60	S.S.W.	Fair and sunny. Very fine.			
3 29-52 29-55 29-50	64	72	62	S.S.W.	Fair and sunny. Very fine.			
4 29-76 29-80 29-82	64	62	57	S.	Rain this morning. Gloomy.			
5 29-86 29-73 29-68	63	62	54	S.W.	Rain this afternoon. Distant thunder.			
6 29-60 29-61 29-60	58	63	55	W.	Fair, but gloomy.			
7 29-77 29-70 29-60	55	57	54	S.W.	Rain a.m. and p.m. Windy.			
8 30-04 30-05 29-50	60	56	56	S.	Fair, generally sunny.			
9 29-65 29-55 29-40	62	56	56	S.	Heavy rain, commenced 9.30 a.m., continued till evening.			
10 — — —	—	—	—	S.W.	Fair, but gloomy.			
11 29-38 29-36 29-38	51	56	52	W.	Fair, but gloomy.			
12 29-40 — —	—	61	—	—	Fair, but gloomy.			
13 — — —	—	55	59	—	Fair, but gloomy.			
14 29-19 29-15 29-12	54	58	55	S.	Rain all day. Windy.			
15 29-00 29-01 29-09	54	53	54	S.S.W.	Heavy showers of rain, with hail, a.m. and p.m. Windy.			
16 29-19 2-22 29-45	54	56	54	S.S.W.	Rain showers a.m. and p.m.			
17 29-60 — —	29-60	58	—	54 S.W.	Fair, but gloomy. Distant thunder.			
18 29-30 29-34 29-34	58	59	—	S.W.	Rain p.m.			
19 29-30 29-26 29-20	60	56	58	S.W.	Fair, but gloomy.			
20 29-69 29-68 29-58	67	60	52	S.	Fair, but gloomy.			
21 29-50 29-56 29-70	64	61	50	S.W.	Rain this morning.			
22 29-81 29-82 29-88	56	61	58	S.	Fair, but gloomy.			
23 29-88 29-90 29-95	58	64	58	S.W.	Fair, generally sunny.			
24 29-87 29-93 29-90	60	65	58	S.	Fair, generally sunny.			
25 29-80 29-75 29-60	60	66	59	S.	Showers p.m.			
26 29-53 29-60 29-73	59	66	54	S.S.W.	Rain this morning.			
27 — — 29-56 29-58	56	61	54	S.	Showers a.m. and p.m.			
28 29-50 29-50 29-53	54	58	56	S.	Rain a.m. and p.m.			
29 29-60 29-65 29-70	59	67	66	S.W.	Rain this morning. Gloomy.			
30 29-59 29-54 29-52	58	61	65	W.	Rain a.m. and p.m.			

Summary.

	Maximum temperature observed	...	...	...	Mornings.	Noons.	Nights.
Minimum	ditto	...	...	...	64°	72°	62°
Mean	ditto	...	...	...	51	53	50
		...	...	...	56.5	61.5	55.4
Mean of whole	...	...	...	...	57.8°		
Number of fair days	...	...	...	...	...	...	15
Number of days on which rain fell	...	...	...	...	...	...	18
Fair days, sunny	...	...	...	...	...	...	6
Fair days, gloomy	...	...	...	...	...	...	9

NOTES.—We have had during the past month somewhat showery weather, as above, and if the old proverb—

"A showery June puts everything in tune"—

is true, we may be quite satisfied. It is, however, to be doubted whether the recent showery weather has not put some of us out of tune, the grass having been out for over a week and not yet got under cover. The rainfall amounted to 3.35 inches, and the evaporation to 3.55 inches, the rain being only 0.38 of an inch in excess.

Chemical Laboratory, Braystones, Beckermat, July 5.

PHOTOGRAPHS REGISTERED.

- Mr. G. F. OAKLEY, Buckland, Kent.
Photograph of Mr. R. Dickson, ex-Mayor of Dover.
- Mr. TREBLE, Norwich.
Seven Photographs of the Duke of Connaught.
- Mr. R. HARRISON, Newcastle-on-Tyne.
Photographic Group, Mr. Hammer and Miss Hunter.
- Mr. McLEOD, Birmingham.
Six Photographs of Captain Boyton.

The Photographic News, July 16, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

ROMANCE AND REALITY—PHOTOGRAPHERS AND ROYALTY.

Romance and Reality.—It cannot be denied that photography has done away with a good deal of romance, especially in depicting the wonderful scenes of nature. Books of travel, with pictures of mountain peaks rising far up into the heavens, and of cascades falling through infinite space, will be less plentiful now that we can get photographic illustrations to compare with them, and travellers who want us to believe their wonderful stories will in future have to produce something better than a sketch in printer's ink in support of their interesting gossip. One of the most amusing occupations we know of is to take up an old book, containing engravings of Switzerland or other land of wonders, and compare the exaggerated illustrations with pictures of the same scenes secured with the camera. The comparison is ludicrous in the extreme. Lakes and mountains are made to lose their character entirely by the way in which the foreground is dwarfed or exaggerated, or objects are added or left out. Clouds are cunningly put in far below the summit of a peak to add to its height, and human beings are rendered of microscopic dimensions beside a waterfall, in order that the latter may be seen at its best. No one has ever seen photographs of such stupendous natural scenes as we here see them, and it would almost seem as if these wonderful phenomena had disappeared from the face of the earth on the advent of photography. Like the odd caricatures of fifty or sixty years ago, these old prints are quite out of date now, and appear to belong to another world than ours. Nature, as painted in the beautiful Swiss pictures of England and Braun, is surely grand and sublime enough without there being any need for exaggeration, and one can see on every hand how of late years the camera has kept in check the too imaginative artist, and has compelled him to moderate his ideas when engaged in depicting waterfalls, mountain passes, and such-like scenes. The highly-tinted views to be met with even now at every place of resort, and which photography has not yet succeeded in driving from the field, are another source of deception which we shall be glad to see vanish altogether. These gaily-coloured prints in blue and rose have enticed many a traveller to forsake his chosen route, in order to visit the enchanting spots represented at the printsellers, or in the hall of the grand hotel where he is staying. Take the case of the big inns in all the most frequented parts of Europe. As the tourist ascends the stairs his eyes are attracted on every hand by smart paintings of spas, and watering-places, and lovely spots in the neighbourhood, where he will be welcome. A well-built hostelry on the banks of a charming blue lake with a few fantastic boats with soft cushions and gay canopies form the subject of one picture, while a Swiss chalet of graceful architecture, with a crystal glacier of magnificent proportions sweeping down into its back garden, is shown in another. All these hotel pictures about Switzerland and the Tyrol are very literal in the matter of glaciers, and, as every tourist knows, there is nothing so difficult to approach. Apparently within half-an-hour's walk, they are often miles and miles away, and as hard to come up to as a will o' the wisp. As photography becomes more widespread, we shall have camera pictures of all these places of resort, and shall be able then to place some reliance upon what we see. There is one objection, however, as regards the truth of photographic pictures which may be taken exception to. Many lenses, those of wide angle especially, have a great tendency to warp the truth and to exaggerate unduly the importance of the foreground, while they depress and render insignificant the heights in the

distance. All landscape photographers know how seriously some instruments pervert the truth in this respect, and for this reason it is well to examine a photograph closely, to discover the nature of the lens with which it has been taken, before placing full reliance upon the scene it represents.

Photographers and Royalty.—When our guest, the Seyyid of Zanzibar, began to make known his wishes to the gentlemen about him who act as guide and cicerone, one of the first desires he expressed was to be photographed, on purpose, as His Highness stated, that he might be able to present his portrait to the many photographers who had begged the favour of his likeness. Our august guest did not quite understand the motive of the many applicants who addressed him, who did not care so much for a single picture, as the honour of welcoming him to their studio. He could hardly have known what a prize he would have been had he permitted only one photographer to take his portrait. When he visited the Bank of England he was shown, among other things, a pile of gold representing forty thousand pounds, and it is said that he remarked to one of the officials that the sum exactly represented his own personal belongings. Although there is probably some mistake here, he would doubtless have been surprised had he known that something not far short of this sum has before now been acquired by the sale of photographs of a couple of royal personages. We do not, of course, mean to say that his worthy picture would have brought in anything like as much, but nevertheless a monopoly to produce them would probably have been worth several hundred pounds. The firm of Ghèmar frères, which still flourishes at Brussels, although the brothers who gave their name to the house have since passed away, made a most lucky *coup* when they secured for themselves the almost exclusive right of producing pictures of the Princess Alexandra at the time of her betrothal to the Prince of Wales. The two royal *fiancés* were at the palace at Brussels on a visit to the royal family there, and the Ghèmar frères, being the court photographers, were fortunate enough to secure a sitting from them. Before the Prince returned to England and his future consort had gone back to Denmark, the Continent and this country were flooded with the pictures, and the negatives had to be multiplied several times to keep pace with the demand, which went on uninterruptedly for many months. Again, at the time of the approaching nuptials, a fresh demand, more inexhaustible than before, set in, and Alderman Mayall, of Brighton, was the fortunate photographer who came in for the slice of luck this time. Mr. Mayall was commanded to attend at Windsor the week of the marriage to take pictures of the royal bride in her wedding gown, and also of the bridesmaids and of His Royal Highness the bridegroom. Only three days' notice was given by Her Majesty, and Mr. Mayall was aware that in a matter of such importance a glazed studio was simply indispensable. There was nothing to suit his requirements at Windsor, he well knew, so the only way out of the dilemma was to take a glass house down with him. A rough sketch was hastily made, a builder consulted, and in a couple of days the glass house stood ready in his own yard. It was taken to pieces and carted down bodily to Windsor, where Mr. Mayall was enabled to pick out a suitable spot for its site. We all of us know how well the photographer acquitted himself of his task, but there are few, probably, who are aware of the rich harvest the little negatives brought their producer; but we may say that Mr. Mayall cherishes his little studio still, and at the present day has it fitted up as a conservatory in his grounds at Brighton. When we add to the receipts realised on these two grand occasions the large sums which a score of other "royal" photographers have made out of the portraits of their Royal Highnesses, we doubt whether the total falls short of the sum we mentioned; but in any case it cannot be gainsaid that the Prince and Princess of Wales have been among the best friends of photographers.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER X.

DEFECTS IN THE NEGATIVE (FAILURES IN THE MANIPULATIONS; FROM GLASS CLEANING TO RETOUCHING THE NEGATIVE.)

(a.) Failure is sure to ensue on collodionizing unclean glass. If the plate has been polished, and not albumenized, the dirty surface may sometimes be detected, when by breathing on it the breath adheres unevenly to its surface. Generally it does not show itself until after development.

(1.) *A slipping off of the film* under the jet of water in washing the negative shows that you have flowed the collodion on the unalbumenized surface, or that the glass is greasy. For greasy glass, place it in the potash dish for a few hours, wash thoroughly under the tap, and albumenize. To guard against collodionizing the wrong side of the glass, stack them on an uniform plan.

(2.) *Glossy precipitate of a silver tint* appearing between the surface of the glass and the collodion film is another evidence of insufficient cleaning, especially where old glass, which has before been used, has not been left long enough in the concentrated potash solution. This appearance is especially noticeable from the back of the negative. Return the plate to the potash, or, which is safer, discard it.

(3.) *Spots of, moss-like formation*, proceeding especially from the lower edge, arise from the dirty state of the plate-holder. The holder should be thoroughly cleaned and coated with shellac or asphaltum, or, if this is not necessary, tallow rubbed round may suffice.

4. *Dirty edges*, and spots proceeding therefrom, are caused by resting the plate on a dirty substance; perhaps the rack in which they drained after being albumenized, a dirty shelf, or drainage on an old piece of blotting paper after sensitizing, or perhaps in handling the plate with dirty fingers—which?

(5.) *Irregular bright spots and short lines* are caused by dust and fibre falling on the plate in the plate-holder.

(b.) Failures in collodionizing the plate are very numerous, and generally the effect of carelessness.

(1.) *A transparent, insensitive margin*, manifesting itself after the plate has left the sensitizing bath, evidences that the collodion film has been allowed to dry too much before immersion in the bath.

(2.) *Rottenness of film* is caused by the collodion not having been allowed sufficient time to "set" before being placed in the bath.

(3.) *Inequality of thickness of the film* shows that the manipulation of coating is faulty.

(4.) *Spots emanating from the corner* by which the plate was held is the punishment for not having clean fingers.

(5.) *Insensitive spots in the middle of the plate*, of round form and answering to the tips of the fingers spread under the plate in flowing it with collodion, are the natural consequences of an improper method of holding the plate, the warmth of the fingers causing a more rapid evaporation of these points, and insensitiveness of the film is the result.

(If the plate is so large and heavy as to necessitate this mode of handling, a stout piece of cardboard placed between the plate and the fingers will overcome the difficulty.)

(6.) *Diagonal streaks* in the direction of the corner whence the collodion has been flowed back into the bottle prove that the plate has not been properly rocked to secure evenness of film.

(7.) *Air bubbles* appear as little holes with thick and thin tails, or as lumps with the same marking of the course they have taken over the film. They are caused very often by holding the collodion bottle, in pouring, too high above the plate, or from agitation of the collodion before pouring.

(8.) *Irregular black spots* are caused by dirt from the neck of the collodion bottle.

(9.) *Comets* sometimes make their appearance when the collodion is freshly iodized, and has not been allowed to settle.

(10.) *White and black lines* also are sometimes an evidence that the collodion is not sufficiently settled, especially in a potassium collodion. Remedy: filter, or allow the collodion to settle perfectly.

(11.) *Shingle marks* are apt to appear in very cold weather, or when there is water in the collodion.

(12.) *Slipping of the film*.—Old or bad sample of gun-cotton used in making up the collodion. (Note.—Be sure, before rejecting the collodion, that the fault is not of your glass or bath.)

(13.) *Veils* are caused by an alkaline collodion, and may be remedied by the addition of a few drops of tincture of iodine.

(14.) *A honeycombed structure of the film* denotes that the collodion is too tough.

(15.) *Insensitiveness of the film* is consequent on using collodion of too great age. Put it aside to mix with that of new preparation.

Numerous defects are caused by using the pouring bottle for the reception of drainings from the plates.

(c.) Failures in sensitizing the plate.

(1.) *Horizontal lines*, known as hesitation marks, show that the dip of the plate has been arrested.

(2.) *Perpendicular lines* are sometimes caused by too rapid dipping of the plate.

(3.) *Splashes* are consequent on too sudden immersion of the plate, causing the solution to splash upwards over the film.

(4.) *Black streaks*, springing from the portion of the plate which has been in contact with the dipper, arise from dirt on the dipper.

(5.) *Spear, cross, or sword-like markings* are caused when the bath contains acetate or sulphate of silver.

(6.) *Pinholes* are caused by an over-iodized bath. Dilute, filter, and strengthen.

(7.) *Fogging or a veiling of the plate* betokens an alkaline bath, or the presence of organic matter. Make slightly acid by addition of nitric acid.

(8.) *Lack of sensitiveness* is met with in sensitizing in an over acid bath, or one containing organic matter. Remedy: neutralize, boil, and filter, and add just sufficient acid to prevent fogging.

(9.) *Grey spots* are caused by the scum that rises to the surface of the bath, which may be removed by skimming with blotting-paper, but more effectually by treatment as a disorganized bath, if very bad.

(10.) *The film being partly eaten away* indicates that the bath contains little or no iodide.

(11.) *Streaks in the direction of the dip* sometimes arise from the plate being withdrawn from the bath before it was sufficiently sensitized.

(12.) *Spots resembling pinholes* arise from dust in the bath agitated by the dipping of the plates and settling on the films.

(13.) *Transparent and pale films* of indifferent sensitiveness are the effect of the bath solution being at too high or too low a temperature. Remedy: regulate the temperature of the dark room.

(14.) *Weak pictures* are not infrequently due to a worn-out bath.

(To be continued.)

THE PRACTICAL PRINTER IN AMERICA.

XXX.

DRYING, FUMING, AND CUTTING THE PAPER.

Drying.—The paper, after it is floated or swabbed, as the case may be, is hung up in a small room, by two of the corners, to dry. This room is generally heated by a

small gas stove, a small jet of gas doing the work in a very short time. To prevent the paper from curling up while drying, a stick having a spring clip nailed at each end is fastened to the two lower corners of the paper. To save the few drops of silver solution which fall from the paper, lay some sheets of bibulous paper on the floor directly under each sheet.

Fuming.—When thoroughly dried, the paper is ready to be fumed. The time of fuming is generally from ten to fifteen minutes. In fuming plain paper, fume it long enough to print blue, and neither red nor brown, as it will print stronger by so doing. In fuming plain paper a much less time is required to reach this blue state than is the case with albumen paper.

Cutting.—It is very seldom that any pieces smaller than a 4-4 is cut, as the ordinary 4-4 copy is generally the smallest ink-print that is made. An ordinary ivory paper,

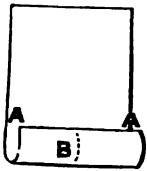


Fig. 1.

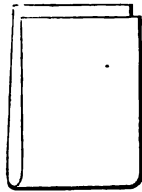


Fig. 2.

cutter can be used for this purpose. In cutting the paper, take the sheet and lay the length before you in the drawer, the width thus running from left to right.

Now bend the paper over to A (fig 1), and crease it at B, and then cut the paper at this crease with the ivory knife. Divide the remaining two-thirds equally, and then the length of each of the three narrow strips is divided into two equal pieces, and thus you will have six 4-4's of an equal size, which will be plenty large enough for the desired purpose. When I wish to obtain the next size, 10 by 12, I take a quarter of a whole sheet of the plain paper. To obtain the next size, 11 by 14, I lay the length of the sheet before me, as I do in obtaining 4-4's, and bend over the sheet until the edge of the paper which was nearest to me comes within about three-quarters of an inch of its opposite side (fig. 2).

The largest of these two pieces I use for the 11 by 14, as there will be plenty of room by so doing to guard against the paper being a little too narrow when the mat is placed over it. When I desire 14 by 17 pieces I bend over as in 4-4's, and take the two-thirds of the sheet. For anything larger I use the whole sheet.

Always, when about to cut your paper, be sure that your hands, as well as shears and ivory paper-cutter, are thoroughly free from grease or anything that will discolour the paper.

Keep the paper in a dark and cool place before and after cutting, and while cutting it do not let any white light fall upon it.

TREATMENT OF THE NEGATIVES BEFORE PRINTING.

It is my object here to give the cases in which a day's batch of negatives should be "doctored" before they are ready to have orders printed from them. I have treated of similar things to negatives that are to have albumen prints printed from them, but those negatives are as far superior to those of the copies, as the palace of the rich man is to that of the miserable hut of the pauper. I have treated of negatives taken from life, the most of which are vastly superior to the majority of copies that are to be printed, consequently more pains are to be taken with the copies than with the life negatives if the printers desire to have the result as fine as possible.

It is often thought by the printers, even those who have printed for years, that in plain paper printing there is no trouble whatever, as they have got to be worked up by the

finisher, and as they are copies the result will be as good as the customers have a right to expect. That person is on the wrong track.

There are a multitude of things to be done in printing copies which are often very troublesome. Unfortunately, in many galleries the photographer is not paid as he should be to obtain the best results from the copies, when the time alone which should be occupied by the printer and ink-worker will come to about what he asks for his work, and then where is the profit to come from for his and his assistant's time? Now the better the prints the printer obtains from his negatives, the better will the result be when worked up, because then the finisher's work can be better done.

Let us suppose that two printers have each a plain-paper print to print from the same negative, each one not being permitted to see the print of the other until they are ready to be toned. One of these printers takes up the negative, looks through it, touches out the pinholes if there are any, and prints it; under the negative a piece of paper is placed, without any special notice having been given to it, to see as to whether it is excellent or not; his print is printed and placed away until toning-time. This printer passes the negative to the other printer, who also looks through it, and touches out the pinholes which the former printer of the negative removed when he was through with it. But this printer does not stop here; he observes the heavy shadows which will print black without any detail whatever (making it an impossible task for the finisher to finish them up as they should be), and proceeds to remove them in a measure; i. e., he lightens them, so that they will not be so dark as they would be if this was not done, and consequently better results are obtainable by the artist. He notices then that the face, hands, and arms are flat, and the last mentioned limbs are also very dark. He cures this flatness in a measure, and makes the hands and arms white. Besides the above, he notices that other parts of the negative can be improved, and he proceeds to do it.

Examine the two prints: what a difference there will be between the two! But let us not stop here, but have them toned, &c., and finished up by the same artist, having previously marked the names of the printers on the back of the mounts of their respective prints. Now compare the two. In one print the shadows, especially those under the eyebrows and chin, are very black, without the least signs of detail, looking very much like a smutch of lampblack, and the face, in spite of all the efforts of the finisher, is flat, while the hands and arms are hideously black. The other print is exactly the reverse; the shadows are as they should be, the face is bold (in comparison), the hands and arms look like the hands and arms of a white person rather than those of a darkey, as the other print would lead us to take the picture to be; and, in fact, this whole print is very much better than the other. The better the print is, the better result can be obtained by the finishing artist.

Having given the beginner an idea as to the importance of printing from copy negatives, I will pass on, and tell what is to be "doctored," and how it should be done.

Shadows.—We will first consider the heavy shadows in these negatives.

It is known by all photographers that such shadows, if there are any, are generally very heavy, and they should always be removed in a great measure. (I will here mention that the beginner should always be on his guard in "doctoring" the negatives, so that he will not overdo it). These shadows are found more or less under the eyebrows, and often in the forehead, which latter place will look like a deep depression there. They are also found sometimes under the eyes, in the cheeks, and a whole side of the face often being very black. They are also found very slightly under the nose, and under the chin—the latter place being the place where the heaviest shadows are generally found. Such shadows are also found in the receding ear (the whole ear sometimes being very black),

also on the hands and arms. They may be removed by the use of the "everlasting blue-paint dodge," which has been so very often spoken of.

Heavy Lines.—There are often heavy lines in the forehead, running parallel to each other, and parallel to the line of the eyes. There are also some few between the eyes, running far into the forehead, and crossing the others.

There are also some found running from both sides of the nose to the corners of the mouth, and in the case of elderly persons from that place (the mouth) to the lower parts of the chin. There are lines oftentimes in the neck, especially so when the neck is bony, caused by the head being turned away from the body in a forced and stiff position.

The way to get rid of such is to take the negative to the retoucher and get him to remove (or do it yourself) the greater part of them. Be careful not to overdo this, but leave something—in fact, considerable—for the finisher to work at.

The face, and sometimes the hands and arms, have lines in them which have not been mentioned, as in the latter case, dark lines caused by large veins, and consequently other places, besides what I have named above, should be sought after, and attended to.

Flatness.—This is the most difficult of all, and very often the finisher had rather have the printer let it alone than for him to attempt to prevent flatness, and make a botch of it. This flatness is often found in the whole face, and in the hands and arms. When you desire to prevent this flatness, take it to the retouching-frame and work up those places which you desire to be lighter, and place a high-light on the nose to make it stand out from the face.

Often a thin stripe of blue paint along the upper part of and along the length of the arms is excellent. Print such negatives under tissue-paper.

I have known cases in which the width of the mouth is desired to be less; then touch out with opaque (or, better still, with a nearly opaque colour, a heavy application of vermilion red answering well), an equal space on each side, unless one side above may be curved, being a one-sided smirk, and if that is the case, only apply the colour on that side. This colour may sometimes be applied to the back, and sometimes to the face of the negative, as may be found best.

If the lips are too thick, take off a portion of them (i. e., if the parties leaving the copies request the photographer to do it; in fact, any of the things that I have above, or shall below name, that depart from the original in respect to likeness should never be done unless orders have been given to that effect). If this is taken off well, then the finisher will have an easy task of making the lips thinner by making the curves nearer together. The light places left can be worked up to obtain the same tone as the rest of the surrounding flesh.

Sometimes there are cases when a hat or bonnet is to be taken off, and when that is so, you will find heavy shadows in the forehead; look out for them. When there is a hat to be taken off, then print a proof of the negative as it is; cut in exactly close to the figure, and when you have got to the top of the forehead, and where the hat commences, cut right close, but under the hat. Use the cut-out (the outside one) for placing on the back of the negative (so that the thickness of the glass will prevent it from printing a sharp line on the print when it is placed under a diffused light), being careful that you get it on as it should be, which, if you do well, the resulting print will be minus the hat, also the upper part of the head; but the finisher will supply the deficiency with his brush. It would be a good thing if you were to feather it off gradually.

PHOTO-MECHANICAL PRINTING.

[THE following interesting historical sketch of the principal photo-mechanical processes in use, and especially the details of their present applications in the United States,

which appears in the *Scientific American*, will interest many of our readers.—ED.]

There is perhaps no more inviting and fruitful field for scientific discovery and invention than in the line of photography, and but little attention to the subject is required to convince one that this field is fast yielding up its treasures to patient and successful investigation. Though the sun is as swift and reliable as time itself, it is too slow and too uncertain to command the full confidence of the artists who wish to form permanent impressions of the varied objects that now come within the scope of the photographic art. Instead of the slow method of waiting for the sun to shine, and then for it to transfer from a negative, one by one, the pictures which will continually fade by the action of light, this work can now be done by the ordinary printing press, and with durable carbon printer's ink. Yet the results thus speedily reached are not like the cheap woodcuts that issue in almost fabulous numbers from the press, but have more the character of the finely-cut lithographic pictures.

In 1839 Mungo Ponton, the chemist of Bristol, England, announced the fact that sized paper, treated with a bichromate, was subject to an alteration, by the action of light, which rendered insoluble the sizing which the paper contained. In this fact lies the germ of all the processes of which it is our purpose to speak. The following are some of the many which are modifications of this principle: carbon printing, in which each picture is itself a sheet of gelatine of required thickness, permeated with the colouring matter, and each impression is made by the direct agency of light; photo-lithography, in which the transfer is made on stone by means of gelatine; photo-zincography, which differs from the last by using zinc instead of stone; photo-galvanography, in which a sheet of gelatine—with the parts not acted on by light swollen by water—is made to serve as a basis of electrotyping; Woodbury-type, in which a sheet of gelatine—with the parts unacted on by light washed away—is used as a means of obtaining, by hydraulic pressure, a metal mould. This mould is filled for every impression with gelatine containing colouring matter, and the print is really an embossing, so to speak, of coloured gelatine on the paper. From the impression on the metal—which is an alloy of zinc and antimony—these types are printed on the prepared paper by a small hand press resembling the printing press.

In 1855 M. Poitevin, a French engineer, discovered that bichromatized gelatine, acted on by light, had the properties of a lithographic stone, and might be used as such. Since the parts on which the light has acted are impervious to water, upon moistening the plate some of it will be dry, some wet; and where light partially acted it will be part dry and part wet. Now, as oil and water repel each other, by putting grease upon this plate it will adhere entirely to the dry parts—those which were exposed to light—partially to those under partial light, and not at all where it took up moisture. And now, by rolling over this plate a cylinder of lithographer's ink, the plate is ready to make a lithographic print. This idea, with modifications in its mode of application, has its representatives in various processes now employed. Among these we will briefly notice only two.

Mr. Joseph Albert, court photographer of Munich, has shown great ingenuity in perfecting what is now called the Albertype process. He commenced in 1868; and after numerous experiments for fixing to the plate on which it is spread the film of gelatine from which the pictures are printed, the happy thought occurred to him to use the sensitive qualities of the chromic gelatine itself for a cement. He consequently used a plate of glass, spread upon it a coating of gelatine, then—while the front surface was protected by an underlayer—exposed the back or glass surface to light, which rendered it insoluble, and hence adhesive to the plate in presence of water. He hardened the sensitive surface by chrome alum, chlorine

water, and other coagulating solutions; and to make it as tough and hard as possible, he spread several films one upon another, hardening each in its turn, till he had made a sensitive plate so hard and durable that thousands of impressions could be printed from one plate. For printing the impression transferred under a negative, he uses a lithographic press, and the ink commonly made to accompany it. After this, no washing, toning, &c., is necessary, but the picture is complete when it leaves the press. Any kind of paper, and any coloured ink, may be used; titles, descriptions, dates, &c., can be printed at the same impression; and one negative can be stereotyped *ad infinitum*. The Photo-Plate Printing Company, of New York, and the Albertype Printing Company, of Boston, are sole proprietors of this patent.

In the heliotype process, some perfectly flat surface is first coated over with wax; upon this is then poured a hot solution of gelatine, after which bichromate of potassa is added, then burnt alum or tannin, to make the surface fine and durable. After it has hardened, the sheet is stripped off and set up in an achromatic chamber to dry. Then the wax is removed, and the sheets are ready for the reception of light under the ordinary photographic negative in the ordinary photograph printing frame. The sheet of gelatine is then forced by pressure under water upon a flat plate of metal; and when the water has been pressed out, it is ready for printing in any ordinary printing press. Several thicknesses of ink are used, and for the deepest shades a little oil is added, which will adhere only to the deeper shadows. The plate must be kept moist in printing, and if moistened with coloured water or Indian ink, a picture resembling a Rembrandt or Indian ink picture can be obtained.

These two processes, with that of the Woodburytype briefly mentioned above, have lately been used with great profit and satisfaction by Mr. Alex. Agassiz and others, for representing natural history specimens in the Illustrated Catalogues of the Museum of Comparative Zoology, Zoological Results of the Hassler Expedition, &c. The negatives of these plates were all taken by Mr. A. Lowell as they are ordinarily made for silver prints. By each of these processes very satisfactory results were secured, as well in regard to expense and correctness of plates as in their general execution; and the prospect is cheerfully encouraging that, ere long, natural science will find in photography one of her most profitable allies. The expense of plates representing results of the naturalist's investigations has long been a serious hindrance to the advancement of science, for a correct figure is often more expressive and instructive than pages of verbal description. By these methods the cost of a quarto plate, including paper, mounting, lettering, &c., and exclusive of the negative, is only ten or fifteen cents per copy; and this is hardly more than the mere cost of lithographic press work, to say nothing of the artist's drawings on stone. The Woodburytype is a little more expensive and cumbersome than the other two, because, on account of the method of preparing the plate from which the impression is taken, it must be mounted for protection. Notwithstanding this, it will not preclude its use, for its pictures have a remarkable resemblance to good silver prints, with all their brilliancy and sharpness.

Another very important advantage those methods have over lithography is in their greater accuracy. By them the original sketches of investigators can doubtless be reproduced, and "subsequent observers will be better able to judge of what has actually been seen, and not of what has actually been added by the pencil of the artist who copies original drawings on stone." Mr. Agassiz finds it less trouble and expense to employ the carbon processes, even when it necessitates occasional visits to New York and Philadelphia; than to superintend, in the Museum itself, the lithographic plates. Again, Mr. Agassiz says: "On account of time required to complete a large

number of plates, either as engravings or lithographs, it would be utterly impossible to issue so great a number of plates within the period required for permanent photographs." From a lithographic plate only about five hundred good impressions can be taken, but here they can be made by thousands. It will also be of great advantage in copying plates from monographs or valuable pictures of any kind which are out of print or otherwise inaccessible.

OUTLINES IN PORTRAITURE.

A CONTRIBUTOR to our Chicago contemporary and namesake gives some advice very similar to that on the same subject given some years ago in our YEAR-BOOK by the late O. G. Rejlander. He says:—

"If young photographers, in arranging positions, would form the habit of looking at the outlines of their subjects, just as if they were a crayon sketch on a blank ground—just a mere outline sketch, independent of all interior contents and detail—it would give them much more readiness and certainty in making well poised and well balanced positions. The outline of the head as it is cut against the ground; the outline of the cheek as turned away; the outline of the shoulder, the waist, the bust, the arms; the sweep of the dress, as the outlines fall away on either side, for a lady or child. For gentlemen, the outline of the shoulders, arms, and legs, when shown, as well as the contour of the head, and the whole poise and balance of the figure, as if made up of the outside, as boundary lines; just those lines which separate the figure from the ground against which it is shown. Take no account of those lines which separate the parts within this boundary from each other until all these exterior boundary lines have been brought into order and symmetry. Taking special care about the head to avoid all angles in the dressing or "doing up" of the hair; preserving and arranging the curves that show the oval form of the head, and reducing to order all lines and angles that destroy or conceal that natural contour. Taking care that all these outlines of the figure and its accessories form, as it were, a framework, like the frame of a building, strong and well seated in its base; well sustained and strengthened in every part; appearing to rest in firm, secure repose, within and of itself. Then the picture, like the building, is ready to be covered, filled up, overlaid with ornamentation, and in detail completed. But unless the outline of the picture is arranged and poised as securely as the framework of the house, no amount of lustrous finish or delicate detail, no shimmer of rich silk caught, or filmy lace detailed, crisp and voluminous folds rendered, can make it satisfactory work. It will be top-heavy, or lop-sided, like the 'leaning tower,' or angular, ungraceful, and unpleasant, in spite of all beautiful chemical effects. Therefore look well to the outlines."

CLEANING VARNISHED PLATES.—The *Scientific American* gives the following as a good method of cleaning off old varnished negatives:—"Dissolve one pound potash in two quarts of water; pour it into an earthenware dish or tray. Introduce each glass separately into the liquid, taking care to prevent air-bubbles. The plates are allowed to remain at least twenty-four hours in this solution; they are then taken out one by one, placed under a tap, and well scrubbed with a cocoanut fibre brush until all the old collodion and varnish disappear. They are then plunged into another dish containing a solution of three per cent. of hydrochloric acid, well washed under a tap, and wiped dry with towels. On no account must they be left to dry spontaneously, or they will become stained. Before the plates are used they require to be cleaned with a solution of rottenstone into which a few drops of ammonia have been introduced."

The Photographic News.

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CELLULOID.—CAMPHOR IN COLLODION.

A NEW substance manufactured from pyroxyline, and described as a solidified collodion, has recently been patented in the United States under the name of "Celluloid." It appears to resemble a preparation patented some years ago by Mr. Parkes, of Birmingham, and named, after its inventor, "Parkesine." It resembles ivory in many of its qualities, and may possibly serve instead of ivory for some photographic purposes. But besides possessing this interest for photographers, there is another suggestive fact about its manufacture, which we note. The pyroxyline in the manufacture of this substance is not dissolved by means of ether, alcohol, or the ordinary recognized solvents, but by what is termed in the *Scientific American* a "solid solvent." The essential point of the invention consists in the discovery that camphor combines with pyroxyline, softening and rendering it plastic at a certain temperature, the new compound being homogeneous and firm in texture, tough and leathery at first, and eventually hard like ivory. The patentees, J. W. Hyatt and J. S. Hyatt, of Newark, N.J., describe the preparation of the material as follows:—

We prepare pyroxyline by grinding it in water to a fine pulp in a machine such as is used in grinding paper pulp. We strain off the water as far as practicable, and then subject this pulp to powerful pressure—for example, in a perforated vessel—to further expel the aqueous moisture, and to bring it to a comparatively solid and dry state, yet still retaining sufficient moisture to prevent it from burning in the further stages of the process.

We comminute gum camphor by grinding it in water, or, preferably, by pounding or rolling it, and thoroughly incorporate, with the pyroxyline pulp in the condition last above described, this finely comminuted camphor, in about the proportion of one part by weight of camphor to two parts by weight of the pyroxyline in the pulp. These proportions may, however, be somewhat varied with good results. The moisture in the pulp serves to counteract any tendency of the camphor to prematurely develop its converting power under any stimulus incident to its being incorporated with the pulp, or to the further stages of the process.

With the camphor we also thoroughly incorporate, with the pulp, any pigments, colouring matter, or other minerals that may be adapted to the requirements of the articles into which the product is to be manufactured. The camphor, or camphor and other ingredients, having been thus thoroughly mixed with the pulp, we next subject the mass to a powerful pressure, in order to expel the remaining aqueous moisture, and thereby not only dry the mixture, but force the camphor into more intimate contact with the pyroxyline throughout the mass, so that every atom of the camphor shall be in condition and place to exert its utmost converting power as developed.

The dried and compressed mass is next placed in a suitable mould or vessel open at the top, and into this open top is fitted a platen or plunger. The vessel is then placed in a hydraulic or other powerful press, and a heavy pressure, applied to the platen or plunger, is brought to bear upon the mixture, which, while thus under pressure, is heated up, by steam or other convenient means, to a temperature of

from 50° to 300° Fah., varying according to the quantity of the mixture; and the mixture is kept at this temperature and under this pressure until the converting power of the camphor shall have been exerted upon the pyroxyline throughout the mass, the heat developing the latent converting power of the camphor, and the camphor exerting this converting power actively upon every atom of the pyroxyline, with which the pressure maintains it in close contact. The process of transformation is rapidly effected, and is completed almost as soon as the mass attains its maximum temperature, the resulting product being a homogeneous product, solidified collodion, or collodion compound having the qualities or properties herein before specified.

This product, as it comes from the press, is of a consistence resembling that of sole leather, but upon exposure to the atmosphere it hardens, by reason of a slight evaporation of the camphor. The ultimate product includes, however, a large proportion of the camphor as a permanent accretion to the mass, which accretion is not only a great gain over the use of ether, alcohol, or other solutions or volatile solvents, which would be entirely expelled or lost, but by its presence gives the solidified collodion or compound the new capability of being again rendered plastic by heat, and remoulded into any desired form or shape, without requiring the use of solutions or volatile solvents, or the addition of fusible gums, as heretofore.

The essentially suggestive portion of the description of this novelty is found in the statement that camphorated alcohol is a solvent for pyroxyline. A weak solution of camphor in alcohol (one part of alcohol to eight of spirit) proves to be what the inventors call a "latent liquid solvent" of pyroxyline: that is, its solvent powers are only developed at an elevated temperature. The patentees observe:—

In using this latent liquid solvent, we first reduce the pyroxyline to a pulp, and mix therewith such colouring or other matters, if any, as are suitable to the required character of the product. The aqueous moisture is then expelled from the pulp. We then add to the dried pyroxyline, or pyroxyline compound, the above-described latent liquid solvent in about the proportions, by weight, of fifty parts of the solvent to one hundred parts of the pyroxyline. The solvent is stirred into the pulp, and the whole kept in a closed vessel until the solvent becomes evenly diffused throughout the mass, no solvent action taking place to retard or prevent this even diffusion, as would be the case in the use of solvents that are active at ordinary temperatures. The compound is then subjected to heat and pressure in a similar manner to that employed when using the solid solvents.

The suggestion to photographers furnished by this description is to the effect that camphor is an aid to the solution of pyroxyline, which may prove of service in the manufacture of collodion. Camphor is well known to aid, when added to spirit, in the solution of gum resins in the manufacture of varnish, and we remember that in an early American patent obtained by J. A. Cutting, camphor in the proportion of a grain and a-half to each ounce of collodion was the salient claim made as effecting an enormous improvement in the collodion positives. We tried the proposed improvement at the time—about twenty years ago—and found no especial improvement, but a decided drawback, inasmuch as a solution of camphor, when dry, leaves a powdery, white, opaque film, and this effect was very apparent in the shadows of the collodion positive when dry and unvarnished, as collodion positives were at the time generally left. The effect disappears at once on varnishing, and would not, therefore, be a defect in a negative. The claim made for camphor was vague: it was stated that the collodion yielded finer half-tones, and a finer and more homogeneous deposit. The fact stated by the inventors of "Celluloid," that camphor aids perfect and homogeneous solution of pyroxyline, renders it probable that, added to collodion, it may assist in securing a homogeneous and textureless film, and may, possibly, also permit of the further reduction of the proportion of ether used in preparing collodion for photographic use. At any rate, the experiment is worth trying, and we commend it to our experimental readers. We conclude by adding another modification of the process for preparing artificial ivory from pyroxyline, camphor, and ivory dust. The inventors say:—

We take, say, one hundred parts by weight of ivory dust, one hundred parts of pyroxyline, and fifty parts of powdered gum camphor. The pyroxyline is ground into a pulp while moist, and

it is afterwards deprived of nearly all its moisture, leaving it slightly damp as a protection against its taking fire from any cause. It is thoroughly mixed with the ivory dust and gum camphor in the proportions just named. After being mixed, the mass is deprived of all remaining aqueous moisture, preferably by pressure between absorbing pads. To this compound, deprived of moisture, we then add fifty parts of nitric ether, and keep the whole within a closed vessel for several hours, or until the nitric ether has become evenly and thoroughly diffused throughout the mass.

The nitric ether permeates and semi-dissolves the ivory dust, the camphor, and the pyroxyline, and thus properly disposes them for final treatment, which consists in bringing the whole compound together into a solid within a heated cylinder or moulds under heavy pressure, or by passing it through heated rollers. From 150° to 250° Fah. of heat is required. The result is a compound which, after being dried or seasoned, resembles natural ivory in compactness and homogeneity. It is free from grain, is not affected by moisture, and is with great facility re-moulded into any desired form by heat and pressure in suitable moulds.

The proportions of ingredients above set forth may be considerably varied to suit the consistence required and the use to which the new compound is to be adapted. To the mixture may be added such pigments as are appropriate to the production of various colours.

BENGAL PHOTOGRAPHIC EXHIBITION.

THE Bengal Photographic Society continues to hold its exhibitions, and the new rules, to which we adverted a year or two ago as of questionable propriety and policy, appear to answer, as we find them announced for renewed application in the programme just issued for the nineteenth annual exhibition to be opened next February. The Society offers many temptations to exhibitors, and ample inducement to English photographers to contribute. Not less than four gold medals are offered, two of which are open to all comers; eight silver medals, four of which are open to all comers; and, oddly enough, but one bronze medal, which appears to be designed as a kind of *solatium* for some worthy exhibitor who has only just failed of taking several of the other prizes offered, as it is offered to the best six pictures, of no particular description, to be selected by the judges from those to which no other prize has been awarded. Besides all these, the judges are empowered to recommend extra medals in cases where they find merit for which no provision is made. In addition to the chances of medals, a further inducement is offered to foreign exhibitors, inasmuch as photographs may be sent without glazing and framing, and the Society will endeavour to sell the contributions instead of returning them.

The questionable rules to which we have referred, as still in force, are those which require all pictures receiving prizes to become the property of the Society for distribution amongst the members, and further enact that the committee may require that two of the negatives of prize pictures shall be given up to them in order to print presentation pictures for the members. It is not to be supposed, of course, that honourable men would take an unfair advantage of such rules, but they are liable to abuse. For instance, Mr. Robinson or Mr. Earl might send half-a-dozen of their large combination landscapes, or the Autotype Company half-a-dozen of the finest carbon enlargements, in either of the cases the intrinsic value of the prints being, perhaps, from ten to twenty guineas. These, not coming in any special class which otherwise commanded a medal, might receive the bronze medal to which we have just adverted, and for this smallest honour, and least valuable medal, such a collection of pictures might be confiscated, and the negatives of two of them might be demanded in addition. We distinctly admit that the issue is not a probable one; but under the rules it is possible, and exhibitors ought, in contributing, to be aware of the possibility. The following is a list of the prizes offered:—

“BY HIS EXCELLENCY THE VICEROY.

“Prize A—Gold Medal.—For the best single photograph in the room.

“This picture is to be chosen first by the judges, and then to be excluded from competition for any other prize. Open to all comers.

“BY THE HONOURABLE THE LIEUTENANT-GOVERNOR OF BENGAL.

“Prize B—Gold Medal.—For the best series of at least six photographic pictures, taken either in or out of India by any member of the Society not being a photographer by profession.

“BY THE SOCIETY.

“Prize C—Gold Medal.—For the best series of, at least six landscapes taken and printed in India by any member of the Society.

“Prize D—Silver Medal.—For the best series of at least six portraits taken and printed in India by any member of the Society.

“Prize E—Silver Medal.—For the best series of at least six photographic pictures, landscapes or portraits, taken either in or out of India by any member of the Society not being a photographer by profession, to be selected by the judges from those for which no other prize shall have been awarded at this Exhibition.

“Prize F—Bronze Medal.—For the best series of at least six photographic pictures taken in India by any member of the Society, to be selected by the judges from those for which no other prize shall have been awarded at the Exhibition.

“Prize G—Silver Medal.—For the best series of at least six photographs of Indian subjects, exclusive of landscapes and antiquities, taken by any member of the Society.

“Prize H—Silver Medal.—For the best series of at least six photographic pictures of Indian antiquities, taken by any member of the Society.

“BY THE PRESIDENT.

“Prize I—Gold Medal.—For the best series of at least six photographic pictures of any kind taken in Europe, America, or Australia, excepting those, if any, for which the Lieutenant-Governor's prize has been awarded. Open to all comers.

“Prize J—Silver Medal.—For the best series of at least six photographs of young children. Open to all comers.

“BY CAPTAIN J. WATERHOUSE.

“Prize K—Silver Medal.—For the best series of at least six landscape views taken out of India, to be selected from those for which no other prize shall have been awarded at the Exhibition. Open to all comers.

“BY T. H. BENNETT, ESQ.

“Prize L—Silver Medal.—For the best series of at least six photographs printed in permanent pigments, by the carbon process or any of the photo-mechanical processes. Open to all comers.

“BY THE HON. SECRETARY.

“Prize M—Silver Medal.—For the best series of at least six photographs, reproductions of works of art, not smaller than 12 by 15. Open to all comers.”

The following are the rules for the Exhibition:—

1. The exhibition will be open in February 1876, and will remain open for one month.

2. The exhibition will be opened to all good photographs, contributed by members of the society and by photographers resident out of India.

3. Only such photographs as have been taken within two years will be allowed to compete for the prizes now specified. No photographs may compete for prizes at more than one exhibition, and no prizes will be awarded to persons who have not actually taken the pictures which they exhibit.

4. The prizes will be awarded on the recommendation of three gentlemen appointed by the committee of the society, and the judges may in any case consider whether or not pictures attain a proper standard of excellence; the decision of the judges will in all cases be

final. The judges will have power to recommend the award of extra medals for any series of photographs.

5. Photographs intended for the exhibition must be properly mounted, but need not be framed, and must be delivered to the secretary by the 15th January at latest, accompanied by a memorandum describing the subject of the pictures.

6. The carriage of photographs sent from distant places must be prepaid. The society will endeavour to have photographs (which do not obtain prizes) sold for the benefit of the sender, if request to that effect be made, but in such cases a price list must accompany the letter of advice.

7. Exhibitors must make their own arrangements for the removal of their photographs the day after the closing of the exhibition.

8. Photographs, to which prizes shall have been awarded at the exhibition, excepting local portraits, will become the property of the society, for distribution among members.

9. The committee will select from the prize photographs two for distribution amongst members of the society, and the exhibitors will be required to give up the negatives of these pictures to the society, or to enter into reasonable arrangements with the committee for the printing of the necessary number of copies.

10. An admission fee shall be charged daily to visitors of the exhibition, members and subscribers excepted.

EMULSIONS.

BY H. J. NEWTON.*

It will be recollected by some of you that I exhibited at one of our meetings some emulsion dry plate negatives. I had at that time just commenced a series of experiments with bromide emulsion, and deemed it advisable not to give any formula until I had completed, or nearly completed, my experiments.

The season of the year has arrived when the excursionists and out-door workers are studying with more than accustomed interest the photographic journals for something new which is applicable to out-door work. I have, therefore, concluded to give you the result of my experiments up to this time. In making bath dry plates, it is necessary that they should be thoroughly washed, to free the sensitive film from all traces of free nitrate of silver, otherwise they will not keep. To effect this with less washing, saving thereby time and trouble, I had adopted the plan of putting the plates into a weak solution of chloride of ammonia, after washing them in two or three changes of water. This left a trace of chloride of silver in excess, the effect of which was beneficial, if any perceptible effect was produced. The substituting, however, of a solution of bromide for the chloride made a very marked loss in the sensitiveness of the plate, because the bromide was in excess.

The fact is, that an excess of chloride of silver in no way injures the dry plate. I have used this fact to advantage in my emulsion experiments. I had tried most of the published formulæ that promised advantages over the results obtained by myself. I had washed the emulsion, and also dried it, and obtained in these ways very sensitive plates. There was, however, in all these modes, the serious drawback of much waste material, a large amount of labour, and expenditure of time. I sought to get the same, or equal results, if possible, in a less complicated and more simple way. To accomplish this, I finally adopted the idea of making my emulsion with the silver in excess, and, after a certain period of time, convert the uncombined silver into a chloride of silver by the addition of some of the soluble chlorides, adding sufficient to leave an excess of chloride in solution. In this way I obtained the bromide of silver in a state of equilibrium. I have experimented with various chlorides, but have finally adopted chloride of cobalt, or chloride of calcium. If there is any difference in the effect of these two, it is in favour of the cobalt. In the course of my experiments I have obtained some (to me) novel and interesting facts, the most important of which is, that the addition of a chloride to a bromide emulsion, where the silver is in excess, will redeem it after

it has gone beyond the maximum point of sensitiveness, and passed into the land of fog.

I will now give you some of the formulæ that I have tried, and the results. I make my collodion with about seven grains of cotton to the ounce, ether five ounces, alcohol three. In this series of experiments, I first took collodion one ounce, and dissolved in it fifteen grains bromide of cadmium. The silver necessary to combine with this amount of cadmium bromide is about eighteen and three-quarter grains; I added twenty-two grains. At the end of thirteen hours it had gone by, and was apparently worthless. I could obtain nothing but fog—not even the trace of a picture; if it had been exposed to the light an hour, it could not have been worse. I then added two and a-half grains chloride cobalt, dissolved in one drachm of alcohol, and shook thoroughly. The next day I shook it several times, and on the third day I got a very distinct picture, but foggy. On the fifth day it was much improved; trying it again, however, on the sixth and seventh days, it appeared to have come to a standstill. There was no advance from the two preceding days. I then added two more grains chloride cobalt, and on the eighth day it gave me pictures of extraordinary beauty; seemingly, there could have been no improvement in the results. My next experiment was with the same proportions of material; I left it, however, after adding the silver eleven hours before adding the chloride, and at the end of four days it was all right, in results equal to the first.

This fogged at the beginning quite as much as the other. I next gave the same formula eight hours after adding the silver that worked equal to the others in two days' time, with the exception that it was not quite as sensitive. In my last experiment with this particular formula, I gave only three hours before adding the chloride; it worked brilliant from the first, but was much less sensitive than any of the others. I then reduced the bromide of cadmium to twelve grains to the ounce, and eighteen grains of silver, fifteen grains being the amount necessary to take up the bromide. This, after remaining twelve hours, was treated as before, and next day worked satisfactorily. This established the fact that the larger the quantity of bromide and silver in the emulsion, the sooner it came to the condition of fogging, and the more time was required to redeem it. I next tried equal parts of bromide of cadmium and ammonium bromides for salting. I found it exceedingly difficult to dissolve five grains of bromide of ammonium in one ounce of collodion.

To obviate this difficulty, I took one hundred grains each of bromide of cadmium and ammonium, and dissolved them in a small quantity of water, and evaporated it to dryness. I found that this compound salt dissolved quite as readily as the cadmium bromide. Without taxing your patience to go through the details of this salting, I will give one result only.

A longer time elapsed before showing signs of fogging than in any of the other formulæ; about fourteen and a half grains of silver would be necessary to convert the bromide. I added seventeen grains, and the chloride two grains, in eight and a-half hours after, and in five hours it worked satisfactorily. Dry plates made from any of these formulæ exhibited great sensitiveness, especially when dry, quite equal, in my estimation, to wet. I have used them for copying engravings while wet, prepared ready for drying with the preservative. From my experience, I think them the most sensitive, however, when dry, although I have not positively settled that point by definite experiment. I have some of these emulsions over two months old, and they have as yet showed no signs of deterioration. If there has any change taken place, it is so far for the better. How long they will continue to improve, or whether their keeping qualities will prove sufficient to make them a commercial article, can only be determined by time.

(To be continued.)

* Read before the Photographic Section of the American Institute.

Recent Patents.

THE LAMBERTYPE PATENT.

THE following is the text of Mons. Lambert's specification describing his mode of enlarging and retouching:—

This invention relates to a new method of retouching, applicable to photographic negatives of any size, whether such are taken from nature, or are enlarged reproductions, and whereby all retouching of the positive print on paper is rendered unnecessary.

In all methods of retouching heretofore practised it has been usual to operate either on the positive paper print, or on the varnished film of collodion constituting the negative from which the positive prints are obtained. This method is tedious and expensive, especially when operating on a considerably enlarged reproduction, and more particularly when taken from a carte-de-visite portrait, the grain of whose paper shows coarser the greater the enlargement. Moreover, it can only be performed by experienced artists, whereas by the improved method of this invention this treatment is considerably simplified.

The following is a description of the improved process:—A negative of large dimensions is obtained with salts of silver, or in carbon with salts of chromium, in the ordinary manner now in use. If I proceed by enlarging, the enlargement may be obtained directly from a small positive image on paper, or from a transparent positive on glass obtained from the small negative, either in salts of silver, or, which is preferable, in salts of chromium specially prepared for the purpose.

The large negative may be produced in an ordinary enlarging camera of large dimensions, but I prefer the dark room for the purpose, as it permits of overlooking the picture and making any modifications deemed desirable, as will hereafter appear. The large negative, after having been properly exposed, developed, fixed, and finished, is covered on both sides with a sheet of thin paper specially prepared for the purpose with paraffine, and subjected to great pressure, somewhat resembling bank post paper, and known in France as "papier minéral," or any other semi-transparent material capable of receiving the colouring matter to be afterwards employed. I, however, prefer this specially prepared paper of a particular grain known as "papier pelure végétal," because it has the effect, when placed on either side of the negative, of neutralizing by its optical combination the defects due to the material of which it is composed, and which seen separately exhibits an exceedingly coarse grain. This novel application will in a great measure attenuate the grain which is always apparent in photographic reproductions from images on paper. It is upon these two surfaces which cover and enclose the negative that the retouching of the picture may be effected in an extremely simple and easy manner, by applying, wherever necessary, either on the collodion side, or on the other side, an impalpable galvano-plastic powder, or other finely divided substance answering the same purpose. This powder is most conveniently applied with a stump. By this means a negative wanting in vigour or harmony may in a few moments be strengthened, and have imparted to it all the softness and the effect of the most carefully stumped drawing. Moreover, the effects of light and shade may be modified, the most perfect degree of softness and an incomparable finish imparted to the picture, so that any subsequent retouching of the positive paper print is dispensed with, the sharpness of the lines being restored with the aid of a blacklead pencil. This treatment may be performed in a few minutes even upon very large surfaces and by persons completely inexperienced in the art of retouching and of drawing. The negative after being thus treated is placed in the printing frame with a sheet of ordinary sensitized paper (prepared either with salts of silver or chromium) whereupon a perfect positive image is obtained.

Should the lines of the primary cliché be too strong or well defined, more especially in the case of large pictures, they may be softened in the positive image by printing it partially, say three-fourths of the time, in contact with the large negative, and then interposing a sheet of very thin glass between the negative and the paper, or before completing the impression a sheet of any other transparent or opaline material not exceeding 0.04 of an inch in thickness may be substituted for the glass.

The complete or partial transformation of the backgrounds, as well as of the draperies, hair, dress, or any part requiring to be modified, may be readily effected in the following manner:—On the positive image previously described is applied a sheet of extra thin glass on which the outline of the subject is traced at a distance of say $\frac{1}{16}$ th of an inch outside of the true outlines to be protected from the action of light. On the mask cut out of yellow paper is then

placed another glass of medium thickness of the same dimensions on which the outlines are similarly traced, but in this case about $\frac{1}{16}$ th of an inch within the true outlines. In this manner the optical effect is obtained without showing the lines of demarcation, and the background may be darkened or lightened to harmonize with the subject.

A plain or graduated background may by the same means be replaced by a landscape, interior, or other adjunct, and vice versa.

The process herein described may be applied to transparent positives of all dimensions, which, after being thus treated, will serve for the reproduction of negatives, no further retouching being required.

Having described the nature of the invention and the manner of performing the same, I declare that what I claim as the invention to be protected by the herein-before in part recited Letters Patent is, the method of applying a semi-translucid sheet on each side of a negative or positive, and of quickly and readily retouching by operating on these surfaces, as herein specified, whereby the tedious and expensive retouching of the negative itself or of the positive print is dispensed with.

Correspondence.

USE OF PIGMENTED TISSUE.

SIR,—As a subscriber and a disinterested amateur photographer, I may perhaps be permitted to describe my plan of treating Lambert's mineral paper.*

I keep a stock bottle containing a solution of bichromate of potash of two or three per cent. strength, and by means of a brush I give two or three abundant applications of this to the Lambert paper, only on the side of the gelatine, however. I wait until the gelatine film has become swollen and the paper is soft and flexible. During this time I take a well cleaned glass, and rub it lightly with a little glycerine, and then wipe it well, the concave side of the glass being used.

I place the plate level in a horizontal position upon a table, and pour upon it some solution of bichromate of potash of two per cent. strength, and then apply the gelatine face of the Lambert paper, taking care to prevent the formation of any air-bubbles.

This done, I pour off the liquid bichromate, and the paper remains adhering to the plate by atmospheric pressure. I put it to dry in a well-ventilated dark room, and when all the moisture has evaporated, I peel the paper off the glass again. In this way I obtain a sensitive gelatinous film, as smooth and as even as a glass plate, and thus secure more perfect contact with the negative, and a much more delicate impression in printing.

To judge of the time of exposure, I do as follows: I contrive by means of white paper floated upon a gelatine bath of fifteen per cent. strength, and a bichromate solution of two per cent., a paper sensitive to light, which I expose in a frame, in the form of little bands upon a cliché, which I always use as a standard.

As soon as I see the image appearing upon the gelatine paper of a pale yellow, I consider that the Lambert paper, which has been exposed to the light at the same time, is sufficiently printed, a little practice being of course necessary in the matter.

On taking it out of the frame, I put the Lambert paper to swell in cold water, and then, having dispersed any air-bubbles which may have been formed, I apply the sheet under water to a clean glass. At the end of a little while I take out the glass and the paper, without, however, separating them, and suspend them in any handy way, the paper underneath, in a warm water bath of a temperature of 40° Centigrade. After a while the paper becomes detached and falls of itself to the bottom of the bath, and the gelatine which has not been acted upon by light also dissolves and falls to the bottom;

* We print the phrase *Papier Minéral Lambert*, as it appears in our correspondent's letter; but he has evidently written the word *minéral* inadvertently, meaning Lambert's carbon or chromotype tissue. The *papier minéral* is the thin transparent paper attached to the negative to receive retouching.—Ed.

there remains only upon the glass the gelatine, which is insoluble in warm water. I allow the print to dry upon the glass in this way. To render the transparent picture more clear, I moisten it with a few drops of benzole.

If interesting to your readers, I can give you the details of a good process employed by an amateur photographer for printing pictures with fatty inks, with very little material, the impressions being exceedingly fine and delicate.—I am, sir,

ROGER LAURENT, Engineer.

Aux Forges de Basse Indre, Loire Inferieure, July 9th.

[We shall have pleasure in receiving details of the fatty ink printing process, for the benefit of our readers.—Ed.]

THE LAMBERTYPE PROCESS.

SIR,—If it will be any consolation to your correspondents to know that I have used, and exhibited the use of, paper backings to negatives for years past, as well as the use of paper on the front, it will afford me much pleasure.

Though I have used paper at the back of negatives for stamping in effects, and on the front for softening and retouching separately, it never occurred to me to use paper on both sides at one and the same time, and if it had I should not have thought the idea worthy of a patent.

For a long time past I have made another use of paper at the back of negatives, and I shall now put the fact on record, lest some other ingenious individual should also conceive the idea and hustle it into the Patent Office. It is this:—Damp a piece of thin writing paper, run a gum brush round the edges of the back of a negative, and lay the damp paper down. When the paper is dry it will be as light as a drum head. Then with a brushful of wet rouge draw the size and shape of the intended vignette. When that is dry soften the inner edge with a stump, and put a rough yellow paper mask outside. By this means a vignetting paper permanently attached to the negative is quickly obtained, and any size, shape, or degree of softness as easily be produced. I have abandoned all other modes of vignetting for this.

When the negatives are treated in this manner printing in sunshine can be practised, and yet the vignettes will be all the same.—I am, yours, &c.,

J. WERGE.

11a, Berners Street, W., July 8th.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE annual holiday and excursion under the auspices of this Society came off on Thursday, the 8th inst. For some days previous the public were being made aware by newspaper advertisements of the intention of photographers generally to close on that day, and so popular has the institution become that every establishment of importance was shut (perhaps with only a single exception).

The excursion was arranged to be by canal barge to "Almond Dell," a trip which, to judge from the fact that the photographers have been already there several seasons in succession, seems to be a very popular one. The hour fixed for starting was nine o'clock, and half an hour before that time the indefatigable secretary (Mr. Yerbury) was on the ground, and, together with several members of the committee, were busy superintending the decorating of the barge. Bye-and-bye cabs and traps of various kinds were seen to issue from the several streets by which access to the canal is obtained, and by 9:30 nearly the whole party, numbering over seventy, had assembled. It is something of a physiological curiosity that on such occasions there must always be some one too late, and this was no exception to the rule, as, on calling the roll, it was found that there were three defaulters. As, however, they had all to travel a distance of many miles, and one of them had to cross an arm of the sea before reaching Edinburgh, there was some excuse to be made for them, and therefore they got another ten minutes' grace, after which, leaving instructions to send them on to Ratho by rail, the order to "let go" was given, and the gaily-decorated barge, accompanied by the cheers of the bystanders, floated gently along the stream.

Immediately on getting under weigh, the President addressed the

assembly, intimating that programmes of the games, and of the order of proceedings for the day, were in the hands of the committee, the members of which had been by the secretary decorated with a blue and gold order of—well, he would not say merit, until the close of the day had shown how they discharged their duties, but would designate it the order of service, and had no doubt that the word "merit" would be fairly earned. He further intimated that the various departments of the proceedings had each been entrusted to one or more of the stewards, to whom and to whom alone, all applications for information, &c., ought to be made. As the programme of the games, which had been written by Mr. Dobie in beautiful fancy letters on a large card, was somewhat unique, we give our readers the benefit of it.

Edinburgh Photographic Society, 8th July, 1875.

1. Foot race, 100 yards (gents).—A gold plated claret jug.
2. Foot race, 50 yards (ladies).—A gold plated opera glass.
3. Foot race, 60 yards, one leg only (gents).—Caso ornato di cigari.
4. Foot race, 75 yards (ladies).—Una album fotografico.
5. Walking match, half a mile (gents).—Cronometre e ornamenti di eleganti.
6. The lady who keeps longest up the skipping rope.—Una forsa di moneta.
7. Putting the stone (gents).—Una lanterna magica.
8. Running, hop, step, and jump (gents).—Una opera di arte.
9. Foot race, 300 yards, running backwards (gents).—Instrumento musicale.
10. Foot race, 20 yards, blindfold (gents).—Una nostra di scultura di legno.

Of course this caused considerable excitement, especially as to where the prizes had come from; but Mr. Dobie kept his counsel so well that no information could be obtained till the time, on the return journey, which had been set apart for their distribution.

Immediately on the close of the President's address the music, which consisted of a piano and a stringed band, was called into requisition, and Mr. Kyles, of Portobello, who had been appointed master of the ceremonies, started the dancing, the first quadrille being led off by the President; and we may say, once for all, that it was kept up with the usual hurr, until, "within a mile of Edinburgh Town" on the way home. Luncheon was served at eleven o'clock, and the dancing was varied by music and singing, of which the Misses Murray, Doeherty, and Paul, and Messrs. Fairbairn, Yerbury, and Muir, &c., contributed a large share; and the time seemed really all too short when the barge was made fast at its destination at 1:30.

On landing, the party broke up into sections, and amused themselves, some on the banks of the Almond, some in romping about the Dell, and some visiting the old miller and his older mill, where they got initiated into the mystery of oatmeal making, and were permitted to taste that article of national consumption as prepared for the Glasgow and Edinburgh markets respectively, as, although those cities are separated by only a ride of an hour and a quarter, the proclivities in the direction of how their oatmeal is prepared are very different.

By 2:30 all had again assembled at the barge, which in the interval had been converted into a comfortable dining hall, and did full justice to the good things purveyed for them by Mr. Lawson, of Queen Street.

Dinner over, and washed down by a liberal allowance of champagne, &c., kindly contributed by a few friends of the Society, the games were at once proceeded with, and were apparently very much enjoyed by the younger members of the party, while a number of those less fond of rather violent exercise strolled through the Glen in twos and threes, enjoying themselves to the utmost of their capabilities.

Shortly before starting, the weather being then somewhat overcast, the whole party were assembled on a bank for the purpose of being photographed. Under the direction of Mr. Ross, the President took up a position to the left of the group, and posed as if in the act of addressing the audience, so that a really excellent picture, as well as a good photograph, ought to have been got. It would not do, however: the suddenly assumed gravity seemed to strike the minds of some of the party as something so ludicrous that they burst into a laugh, which instantly became contagious, and the lens had to be capped before half the necessary exposure was given. The result, of course, is just sufficient to show that a fine picture has been missed, and to hint that such operations should always be made before dinner.

At six o'clock the barge again got under weigh, and the homeward journey was certainly quite as enjoyable as the outgoing one. Immediately after starting, tea was served, and the music and

dancing were resumed, with quite as much energy as in the morning.

When about half the journey had been accomplished, Mr. Dobie placed a large trunk in the centre of the barge, and, assisted by the Secretary, proceeded to call out the names of the successful competitors for the various prizes, the presentation of which was really the feature of the evening, so far as fun was concerned. This will be evident from the mere mention of the nature of one or two of the prizes as they were unfolded from the somewhat large quantity of paper in which most of them were enveloped. The "Cronometre e ornamenti di eleganti," for example, turned out to be a *penny watch*; while the "Instrumento musicale" was a toy trumpet of a like value, "Una nostra di scultura di legno," one of the ever popular jumping Jacks, that give so much pleasure to the rising generation.

Shortly after the distribution of the prizes, the President requested the party to form a circle in the centre of the barge, and intimated that it had been the habit on former occasions to propose a few toasts. He thought the habit should not be departed from, and promised that the business should only occupy a very few minutes. The first toast was, of course, the "Queen," and he knew that it was only necessary to mention it to secure a hearty reception. The toast was responded to with acclamation, and after the National Anthem had been sung he proposed the toast of the day, the "Edinburgh Photographic Society," which was also, of course, duly honoured. Mr. Davies then said that he had been asked to propose the health of the "Donors." This he really had much pleasure in doing. Mr. Muir, their excellent ex-president, he said, was coupled with the toast, and although he well deserved the very great honour, yet, from motives of policy, he must decline to do it. The fact is that Mr. Muir, as we all know, is given to make such long speeches that, if he were to begin, and continue till we get home, where would the dancing be? Mr. John McNair, Mr. Stoddart, Mr. Robert Hay, either or all would have done admirably, except for the little fact that they were not present; and as neither the ex- nor the present secretary were available, he had, most reluctantly, to fall back on Mr. Dobie. Mr. D., however, had given his word that he would not speak more than an hour; and as he, by his genius, wit, and humour, combined with his eleven other good qualities, had, in keeping up the fun and frolic, cast into the shade all the rest of the party together, he fairly deserved the honour of having his name coupled with the grand array of donors; may they grow in numbers and liberality every year. Dr. Nicol said that he had been asked to propose the health of their excellent purveyor, Mr. Lawson, who had, he was certain, discharged his rather difficult duties to the entire satisfaction of all concerned; and, as so much depends on a good dinner, he was quite sure that in that way he had contributed much to the success of the excursion. The only other toasts were the "President," the "Ladies," and the "Committee," all of which were heartily responded to, and then the dancing was resumed.

In this way the journey and the evening passed very pleasantly until shortly after ten o'clock, when, amid the ever-welcome, yet, as a parting song, somewhat saddening, strains of "Auld Lang Syne," the barge was made fast at home once more, and, amidst much hand-shaking, and many resolutions "to meet again some other day," each looked for the nearest road to his or her habitation, all delighted with the proceedings of the day.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

An ordinary monthly meeting of the above Society was held on Monday evening, the 5th inst., at the Victoria Hotel, Bradford, when there was a numerous attendance, Mr. J. W. Gough, President, in the chair.

After the confirmation of the minutes of the previous meeting, a somewhat lengthy discussion on the relative merit of wet and dry-plate photography took place. One of Mr. George Hare's automatic changing-boxes was inspected by the members, and greatly admired for its simplicity and working capabilities, and its fine, easy, and ingenious movement.

After numerous expressions of admiration from Messrs. Wormald, Burrows, and others,

Mr. A. SACHS proposed a hearty vote of thank to Mr. Hare, which was seconded by Mr. Whitley, and was cheerfully responded to by the members.

A conversation then ensued respecting the weekly half-holiday which has or is likely to become universally adopted in the Bradford, Halifax, and Leeds districts.

Mr. SMITH, of Halifax (in reply to Mr. Sachs), said they ought to make some sacrifice and try for a whole day, so that member

wishing to take any pictures at a distance would be able to do so, as they could not go far from home during half a day, more especially if they had to give three-quarters of an hour's exposure.

Mr. HARPER, of Leeds, thought it was very nice to be able to go for a whole day, but concurred with Mr. Sachs that it would in all probability be very inconvenient to close their places of business for so long a time, especially where a considerable number of hands were employed, as it would necessarily involve a consideration of pounds, shillings, and pence.

Mr. SACHS said it could not reasonably be expected of them to close for more than half-a-day; it would not be businesslike to do so, as persons might come from a long distance earlier so as to sit before closing time, and if the holiday were made into a whole day the result would, doubtless, be a serious loss of business.

Mr. W. E. BATHO was of opinion that to try for a whole day would probably result in the loss of the boon they already possessed.

After several expressions of opinions, *pro* and *con*, by Messrs. Holgate, Gough, Kushforth, Wormald, Jenkins, &c.,

The SECRETARY announced a question from the box, viz., "What effect will albumenized plates have on the negative bath, and will they cause fog?"

Mr. SACHS had used it for a number of years, and had never found any disadvantage.

Mr. LLLINGWORTH informed the members that he had used it for more than two years, and was highly pleased with the results; but if any albumen got on the edge or back of the plate he had no doubt it would cause fog.

Mr. WORMALD informed the members that he had successfully used as a substratum a solution of thirty grains of gelatine to a quart of water, using it over and over again until about one hundred 12x10 plates had been coated.

The CHAIRMAN and several gentlemen having spoken on this subject,

Mr. BATHO then read a paper on "The Lambertype." (This paper has not yet come to hand.)

The CHAIRMAN said (alluding to the remarks of several members) that if a person was not in a position to oppose a patent, and had used the same process before the patent was granted, it was the duty of the other members of the profession to assist him should he have cause to test its validity in a court of law.

Mr. BATHO remarked that unless photographers in this country took a stand unitedly, they would not be able to resist these things, and must, consequently, submit.

On the motion of Mr. Burrows, seconded by Mr. Sachs, a very cordial vote of thanks was tendered to Mr. Batho for his practical paper.

A conversation then ensued respecting the more frequent reading of papers at the Society's meetings. It was considered a somewhat difficult matter to get papers on scientific subjects at this time of the year, as photographers were too busy to have the necessary time for making experiments.

It was then resolved that the next excursion should be to Kirkstall Abbey, near Leeds, on the 21st instant, and the meeting then adjourned.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

A SPECIAL meeting of this Association was held on Tuesday evening, the 18th instant, at the Free Library, the President, the Rev. J. D. RILEY, in the chair.

The PRESIDENT said that the special meeting had been called to give the members an opportunity of witnessing a demonstration of the autotype process. He then introduced to the members Mr. H. Taylor (the representative of Messrs. Spencer, Sawyer, Bird, and Co.). Mr. Taylor, after a few remarks explaining the manner of preparing the different papers, &c., used in connection with the process, then proceeded to give a number of practical illustrations of its working.

Several pictures were developed on the new flexible support, and also on opal glass; and though Mr. Taylor had not had the opportunity of previously printing from the negatives to ascertain the number of tints required, the pictures were perfectly printed, showing that the supposed difficulty of exact exposure was easily overcome after a little practice in judging the density of negatives.

Some prints were afterwards transferred to the double transfer paper, and others transferred so that, on being finished, the prints had a beautiful enamelled surface. Other illustrations were given of the double and single transfer processes, all of which were watched with the greatest interest by the members, Mr. Taylor answering meanwhile numerous questions, he being evidently anxious that all possible information should be given.

The PRESIDENT, at the conclusion, said that he, and he was sure the members also, had been exceedingly delighted and interested by the practical illustrations of the working of the autotype carbon printing which they had just seen. He had, therefore, to express the thanks of the Association to Mr. Taylor for the able manner in which he had given the demonstration that evening. The process was so simple and easy that no one who desired to have permanent photographs would hesitate to adopt it.

Mr. TAYLOR, in reply, said he would only be too glad to give any explanation if necessary, and concluded by handing round a number of specimens of what the process was capable of producing. The meeting was shortly afterwards adjourned.

Talk in the Studio.

A NEW GENERAL ANTIDOTE FOR POISONS.—M. Jeannel gives the following formula for an antidote for a number of deadly poisons: Solution of sulphate of iron (D. 145) 100, water 800 calcined magnesia 80, washed animal charcoal 40. These ingredients are kept separate, the solution of sulphate of iron in one vessel, the magnesia and charcoal in another, with some water. When needed, the sulphate solution is poured into the last-mentioned receptacle and violently agitated. The mixture should be administered promptly in doses of from 1-6 to 8-8 ounces. From experiments M. Jeannel finds that this antidote, employed in proper proportions, renders preparations of arsenic, zinc, and digitaline completely insoluble. It does not render oxide of copper absolutely insoluble, however, and leaves in solution notable quantities of morphine and strychnine. It neither decomposes nor precipitates cyanide of mercury nor tartar emetic. It saturates free iodine entirely, and acts but partially upon solutions of alkaline hypochlorites. Four ounces of the antidote are found to neutralize the poisonous effect of 1-6 ounces of arsenite of soda. It retards the toxic action of sulphate of strychnine, affording sufficient delay to administer evacuates. One-third of an ounce is efficacious against digitaline injected into the intestines.—*Scientific American.*

OBSCENE PHOTOGRAPHS.—The seventy-second Annual Report issued by the Society for the Suppression of Vice states that the Society's operations are regarded as so far satisfactory to the committee that they have for the past year little to record in the way of active work beyond vigilant observation, so completely has the trade in obscene books, pictures, and photographs been paralyzed. A peculiar feature of last year's operations is stated to be the voluntary surrender to the Society by dealers, or relatives of deceased dealers, of large stocks of obscene matter, among which figure 8,550 photographs. At the time one offender was arrested there were seized on his premises 91 negatives used in the production of obscene pictures. Seizures were also made in three other cases respectively of 950, 221, and 219 obscene photographs. One feature noted in the disgraceful trade was the professed sale of photographs of noted actresses to cover the sale of indecent pictures. The committee express the opinion that the limited trade in these objectionable pictures is due to the caution induced by dread of selling to a society's agent.

ALLEGED PHOTOGRAPHIC PIRACY.—On Saturday last, at Wandsworth Police Court, John Patrick Conroy, described as a picture dealer, living in Stonell Place, Chatham Road, Wandsworth Common, was brought up on a warrant charged with selling a copy of a registered picture. Mr. George Lewis, who appeared for the prosecution, said the prisoner and his wife had been charged before. He called Mr. Boydell Graves, son of Mr. Henry Graves, printseller to the Queen, Pall Mall, who produced the certificate of register of copyright in a painting entitled "Piper, and Pair of Nut-crackers." He said the photograph produced was a copy of the design and painting. He never authorized the defendant to copy it. Arthur John Spence, a picture-frame maker, of Harrow Road, Paddington, said about the 6th of June he purchased of the prisoner the photograph with several others. He told him not to show them in the window, because he thought they were dangerous. Mr. Lewis applied for a remand, to enable him to proceed with other cases. The prisoner objected to the proceedings, and said a summons should have been issued, so as to give him time to prepare his defence. Mr. Ingham said a warrant was granted because it was stated that the prisoner had disappeared on various occasions after summonses had been served, and had not re-appeared until six months had elapsed, which was the limit of the magistrate's summary juris-

dition. An application being made for bail, Mr. Lewis urged the magistrate to make it substantial. Mr. Ingham said he would take two sureties of £50 each, or one in £100 for his appearance.—*Times.*

To Correspondents.

JOHN STONE.—The description of the new enlarging stereoscope introduced by M. Hermagis appears in the letter of M. Ernest Lacan, our Paris Correspondent, in the PHOTOGRAPHIC NEWS of June 18th. We are not aware of any place where it can be purchased in this country. The paragraph which calls your attention to the matter was written in answer to a question forwarded to M. Lacan by one of our correspondents.

A SUBSCRIBER.—There is no objection, in the preparation of any collodion, to making the plain collodion and the iodizer each separate, to be mixed when required. But in using iodide of potassium there is a difficulty in doing this if the alcohol be very free from water, owing to the sparing solubility of iodide and bromide of potassium in strong alcohol. Hence it facilitates matters to dissolve the iodides and bromides in the total amount of alcohol to be used, instead of attempting it in a portion of the alcohol to be kept separate for the iodizer.

HUXTON AMATEUR.—No. 1 is not a maker of high reputation, and as his lenses will probably vary in quality, it is quite impossible to say whether one will define well or work rapidly without trial. You will find it wiser to obtain one by a good maker, which may be done moderately cheaply of a dealer who supplies second-hand apparatus. The card sent is not sufficiently well defined to give a good enlargement. It is somewhat flat, from being illuminated by a general diffused light. To obtain relief, vigour, and pictorial distribution of light and shadow, a good light from one direction, with the remainder more or less in shadow, is necessary.

LAUGHER.—There can be no harm in laughing at the the circumstance if it amuse you. "Laugh and grow fat!"

E. S.—The crapy reticulation of which you complain is due to the use of collodion containing too much water, and when the tendency is present it is much increased by the use of mercury. A new sample of collodion is the best remedy. Allowing the film to set well before immersion in the bath will help you, as will also avoiding mercury in intensifying.

CHEMISTS.—Your description is too vague to enable us to help you. Possibly you may mean the Dictionary of Chemistry, published in parts by Longman and Co., Paternoster Row. Ask your bookseller for details.

YOUNG BEGINNER.—There is no work on photographing on wood, but many articles on the subject have appeared in our pages. The same answer applies to photographing slides for the magic lantern.

IGNORATIO.—The article is sold as enamelled paper by all stationers.

S. P. Q. R.—The quality you require is "depth of focus," and your idea of what this quality consists in is tolerably accurate. Depth of focus consists practically in the absence of a perfect focus at one plane and no other, and in the presence of moderately good definition distributed over many planes at different distances. This is a quality present in the single landscape lens, and not present in the most highly corrected of the old fashioned forms of portrait lens. Of late years, in deference to the demands of artistic portraitists, changes have been made in the portrait lens. Flatness of field consists in definition extended over as large a flat surface as possible, or, in other words, the correction of the naturally curved field over which a lens defines. You must remember that in the manufacture of lenses—photographic lenses especially—the work of the optician is to make a series of compromises, and he who secures the most of the desirable qualities at the least sacrifice—in short, makes the happiest compromise—makes the best lens. A good single lens does well for landscape work, and the front lens of a portrait combination sometimes answers fairly. But modern combinations secure the greatest balance of advantages. If you send a list collected from advertisements, indicating them by number or letter, we will give you more individual details.

CONSTANT SUBSCRIBER.—The general proportions of your studio will serve pretty well, although two or three feet additional in length would frequently prove of service. We fear, however, that you will find a west light very troublesome, as you will frequently have direct sunlight entering the studio. Such a studio might with advantage be made of the lean-to form. But if you prefer a ridge roof, the ridge two feet out of the centre will be useful. With a room 21 feet long, 5 feet at each end opaque will be sufficient, so as to secure 11 feet of glass any part. This you can always cover; but if you had too little, you could not remedy it. A provision for taking Rembrandts, to be covered when not in use, will be convenient. If you send to our publisher the date of the number you require, he will forward it.

REJLANDER FUND.—Received, from Mr. John Stone, £1. Several Correspondents in our next.

The Photographic News, July 23, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY AS AN IMPARTIAL RECORDER.—MR. CRAWSHAY.

PHOTOGRAPHS OF SALMON.—THE TRANSIT OF VENUS.

Photography as an Impartial Recorder.—Within the last week photography has stepped in most opportunely, and decided a point of some importance in connection with the defences of the kingdom. Some discussion has taken place of late in the House of Commons, as our readers may know, on the subject of the big guns they manufacture at Woolwich, and the degree to which these weapons are capable of penetrating the ironclads of the present day; and to set matters at rest the Secretary of State for War decided upon a trial of the guns at Shoeburyness, to which those members of the House especially interested in the subject were to be invited. This trial came off last week, and, according to the reports made by the press, one of the heavy guns—the 25-ton gun—made some excellent practice against a newly constructed target made up of two heavy iron plates with six inches of timber between them. It was reported that two projectiles were sent through this target at a distance of 70 yards, but Captain Price, M.P., who was present at the experiment, denied this, stating that one shot got half-way through, while the second one, either through accident or design, hit the structure on the margin at a weak point, and was thus enabled to pierce the thicknesses of iron and wood. In answer to this complaint, we are told that the shots were fairly aimed, and that, further, a bull's-eye was painted on the part of the target it was desired to hit. Fortunately the dispute can be easily decided, because all practice made at Shoeburyness from time to time is recorded in the most impartial manner by the camera, which cannot in any way be charged with bias. As many of our readers know, the War Office in this country have made great use of photography in many ways, and at Shoeburyness there is a staff-serjeant of the Royal Artillery, and a gunner, whose sole duty it is to secure records of the war that is continually waging between big cannon and iron targets, or, as some call it, between guns and ships. Front and back views are taken of every target that is constructed, both before and after firing, and these photographs not only show the precise damage that has been done by each shot, but also how far out the shot marks are from the white bull's-eyes painted on the target. These targets represent the ships of war in the navy, being constructed of the same thickness and in the same manner as the bulwarks of an ironclad. Thus at Shoeburyness we have had a *Warrior* target, a *Bellerophon* target, a *Hercules* target, &c.; and whenever a new class of vessel is added to the navy, it is represented by a target of the same name at Shoebury. In this way we have come to learn exactly what each of our ships can withstand in the shape of guns, and the reason why our guns are every-day growing bigger is simply because the Admiralty authorities of this and other countries are constantly adding to the thickness of the iron-plating. From the very first, the War Office have had photographs prepared of the effects of the various guns on different targets, and it has thus secured an impartial record of the whole subject. In the present instance, it would be only necessary to produce a picture of the back of the targets to prove whether the shot Captain Price alludes to pierced the target or not, and in the same way, if a bull's-eye was actually painted on the target, and the accuracy of the firing was so perfect as to obliterate it, there is no doubt that the front view of the target would also show some signs of the remains of the whitewash. We have here a capital instance of the value of photography as an impartial recorder of facts.

Mr. Crawshaw's Photographs of Salmon.—In *Land and Water* Frank Buckland alludes to some photographs Mr. Crawshaw has sent him of remarkable salmon and fish caught upon the Cyfarthfa estate. Mr. Buckland is delighted with these pictures, and says, "As a lover of fish,

I pronounce these photographs to be most interesting and valuable. A professional photographer, a friend of mine, tells me they show first-class workmanship. I intend, therefore, sending them over to the Paris International Exhibition of Fish Culture, where they will doubtless be much admired." Mr. Crawshaw's pictures do not merely include photographs of fish of unusual size, which might be pleasant reminiscences for a sportsman, but of little use besides; as one who takes great interest in pisciculture, he makes a point of securing a record by photography of any object he thinks worthy of study, or likely to interest those students of natural history who devote themselves more especially to this branch of science. Thus, by means of photographs of half-a-dozen salmon taken late in October, he proves beyond doubt that that time of the year is far too late to continue the season, the fish having ova to the extent of two or three pounds attached to them. One fish he photographed had 2 lb. 10 oz. of ova, and as one ounce contains 327 eggs, there were, consequently, 13,734 eggs lost to the river. Mr. Crawshaw's interesting collection of fish photographs also contains records of some very remarkable things that have come under his observation. To give an instance. There is a picture of an eel 2 lb. 1 oz., which had swallowed another eel of 1 lb. 1 oz.; the latter had been taken on a night line, and the bigger one had then seized him, and they had both been pulled out of the water together, without the larger one having been hooked at all. No wonder Mr. Frank Buckland, who is one of Her Majesty's Inspectors of Fisheries, considers Mr. Crawshaw's collection of piscine portraits of considerable value to the naturalist.

The Transit of Venus.—Captain Tupman, the last of the observers sent out from this country to watch the transit of Venus across the sun's disk, has returned from the Sandwich Islands, and the data he brings with him will complete the information which the Astronomer-Royal is likely to get on the subject, and from which the calculations will have to be made. For some time past mathematicians have been hard at work at the Royal Observatory, and we are told that the reductions of the British observers are actively progressing on a uniform system. Now that the last information on the subject has been received, we may expect to have the result of the observations very shortly; and it will be interesting to see how far the *savans* of different countries coincide with one another. As the observing stations taken up were not in all instances the same, the calculations will be different; and it will be a matter for great rejoicing if, therefore, the distance from the sun to the earth is made the same by the learned men engaged on the calculations in various countries. The working out of the data is a most complicated affair, and Russia has been cited as the likeliest country to get through the calculations first, the Russian astronomers and mathematicians being reckoned among the most clear-headed of the fraternity. Had China taken part in the solution of the problem, it is not unlikely that it would have been among the foremost to decide the question. When we have got to know how far we mortals are from the glowing luminary, it will take other clever people in the world to tell what the information has cost us.

FRENCH CORRESPONDENCE.

DEATH OF M. TORAVKO—WHEY DRY PLATES: THEIR EMPLOYMENT WITH ARTIFICIAL LIGHT—PRINTING BY DEVELOPMENT—PORCELAIN COLLODION—DARLOT'S DARK TENT.

IN the course of last year I had occasion to call the attention of the readers of the PHOTOGRAPHIC NEWS to a dry collodion process in which serum, or whey, was employed, and which had been worked out by a Russian amateur, M. Pokorski-Toravko. My correspondent had promised me further details of his work in this direction, but for some time past I failed to hear anything of him. The reason of his silence I have just learnt. M. Toravko died, I regret to say, in June, 1874, but, faithful to his promise

he had prepared, it seems, a memoir of his last work, and this his relatives have just been good enough to forward to me. M. Toravko's work has for this reason a double interest, and I propose to give a resumé of it, for the benefit of your readers.

The last experiments made by M. Toravko were made with a view of perfecting his process with whey, and with a view of succeeding in nocturnal photography. The collodion employed by M. Toravko contained three per cent. of bromide of cadmium, with an excess of alcohol, but in other respects it was the same as that used by the late Mr. Sutton. After coating a plate and waiting some twenty to forty seconds, to allow the film to set, it was plunged into a silver bath of eighteen per cent. strength acidified with nitric acid, where it remained for five minutes. The film was then washed in distilled water, also acidified with a little nitric acid. Having repeated the operation two or three times, the plate was washed thoroughly in ordinary water. To preserve its sensitiveness, the plate was covered with a preservative made of

Whey of curded milk	... 100 grammes
Potable water	... 200 "
Citric acid	... one or two drops.

The mixture was warmed, and, after two or three boilings, it was filtered through a piece of linen to separate the caseine; it was then allowed to cool, and the white of an egg added. The vessel was replaced on the fire, and after the mixture had been boiled again, it was further filtered through paper. The clarified whey should be limpid, and of a greenish tint. One hundred grammes are added to 0.20 grammes of pyrogallie acid, and the mixture filtered again. This preservative was applied two or three times to the washed collodion plate, and the last application allowed to remain on the film for the space of a minute. The plate was finally washed, and dried spontaneously by allowing it to remain upon a sheet of filter paper. The preservative gives such adherence to the collodion film that the latter can only be removed from the glass with difficulty. The prepared plates will keep their sensitiveness, which is of a most exalted character, for several months. Five or six seconds' exposure with a portrait lens is sufficient, while with an ordinary landscape lens twenty to twenty-seven seconds are required. The exposed plates are treated with alkaline development, the three solutions given below being prepared first of all.

No. 1.—Bromide of potassium	... 4 parts
Water	... 200 "
No. 2.—Pyrogallie acid	... 1 part
Water	... 200 parts
No. 3.—Liquid ammonia	... 100 "
Water	... 100 "

Ten minutes ought to suffice for the development, and if, after fixing with hyposulphite of soda, it is found that the image is not intense enough, it may be intensified with

Water	... 100 grammes
Pyrogallie acid	... 0.50 "
Citric acid	... 0.50 "
Five per cent. solution of nitrate of silver	... a few drops.

As M. Toravko found these plates so exquisitely sensitive, he resolved to try them for nocturnal photography, illuminating a landscape by means of artificial light, and was enabled to secure a result after an exposure of twelve to fifteen minutes with a portrait lens, and of twenty to thirty minutes with a landscape lens.

In securing direct positives, the exposure required was naturally a shorter one. My late correspondent was enabled to draw up a table in which the necessary exposures are given, according to the progressive power or the artificial light, varying from one to two hundred and forty candles. With a light equal to that given by one candle, for instance, it is necessary to give an exposure of two hundred and forty seconds to get a direct positive image, and with two hundred and forty candles, or with twenty-four lamps,

representing a total of as many lights, it is possible to get a picture with an instantaneous exposure. I should mention that to obtain the full benefit of the illuminating power, the experimenter has devised an arrangement of screens and reflectors, which concentrate the whole of the light upon the object to be reproduced. The author of these interesting researches did not confine himself to obtain positives and negatives on glass by means of artificial light, but he prepared a paper also, by means of a process he has described. Ordinary albumenized paper was floated for about thirty seconds on a bath prepared in the manner following:—In a hundred parts of albumen and ten of whey, are dissolved two parts of bromide of potassium and two of citric acid. After mixing, the liquid is beaten to a froth, and then allowed to stand, the clearer portion being decanted off, and filtered through cotton wool or sponge. The paper after treatment upon this bath is hung up to dry, and may be preserved for a long time. It is sensitized upon a silver bath of eighteen per cent. strength; the bromised paper is plunged into it for a period of four or five minutes, and is then transferred to a vessel containing water acidified by means of acetic acid, where it is left until a second sheet of paper has been treated in the silver bath. The first sheet is then put into pure water for a few minutes, after which it is turned into a flat dish containing the same preservative as that described above for dry plates. Finally, the paper is rinsed in clean filtered water and dried.

Thus prepared, the paper keeps its brilliancy perfectly, and furnishes prints as fine as ordinary fresh albumenized paper. It will retain its good qualities for a month at least. Exposure to the light of a couple of lamps is sufficient to make the print appear feebly in the deep shadows after an interval of about fifteen minutes. Even after ten minutes the development may be undertaken with good effect, and in less than half an hour the whole operation is finished.

The developer is composed of—

Water	... 1000 grammes
Pyrogallie acid	... 1 gramme

And when the latter has been dissolved in the water, one-fifth of a gramme of acetate of lead is added. The liquid is then clarified (for it has assumed a milky appearance) by adding, drop by drop, a saturated solution of citric acid.

It is well not to have recourse to nitrate of silver, which makes the image appear more rapidly, it is true, because the finished print is then not so perfect, the silver becoming precipitated, and injuring both the lights and the shadows. As a matter of course, many prints may be developed at the same time and in the same bath.

At the end of these communications, and in the form of an appendix to his memoir, M. Toravko has given us the composition of a particular collodion which he calls porcelain collodion. Its composition is—

Collodion 1½ per cent.	... 80 grammes
Mirha, gum	... 1.50 gramme

The gum is dissolved gradually in the collodion by shaking the liquid from time to time, and the collodion is then allowed to rest until it becomes clear. The collodion is applied to glass in the ordinary way, and a smooth white film is formed, having the appearance of ivory or fine porcelain. In this way opal glass may be replaced in the production of transparent positives.

This porcelain collodion may be coloured very readily by means of aniline colours, and may thus be made to furnish some very fine effects in this way as transparencies.

I had occasion lately to see a pretty little dark closet constructed by M. Darlot, which will, I hope, shortly be put into commerce. It is suited for dry-plate work, not only for the use of amateurs, but also to fulfil the exigencies of professional photographers, who are, as we know, more hard to please than the former. If the closet and the apparatus connected with it cannot be called *perfect* affairs exactly, they are, nevertheless, by reason of their

extreme lightness and their small volume, far more portable than any of the apparatus usually employed by photographers out-of-doors.

I hope in a future letter to give you some further details respecting these ingenious apparatus, but content myself on the present occasion with merely bringing them to the notice of your readers, and mentioning the name of their ingenious constructor.

ERNEST LACAN.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER X.—(continued.)

DEFECTS OF THE NEGATIVE PROCESS.

(d.) Failures in "exposure" of the negative.

(1.) *Want of sharpness*, caused by faulty focussing or the movement of the sitter out of focus before the exposure of the plate.

(2.) *Double outlines*, or "*blurring*,"—Movement of the sitter during the exposure. Don't get angry.

(3.) *Harshness*, and exaggeration of light and shadow, are due to insufficient exposure.

(4.) *Flatness*, and *lack of brilliancy* in the shadows, are caused by over-exposure.

(5.) *Marbled drying spots* are often due to the above cause, or from the plate having stood too long before being exposed.

(6.) *Foggy spots* are caused by reflection: look to this in copying drawings or paintings; the illumination is at fault.

(7.) *Fog* is produced by strong light shining into the lens. Remedy: protect it with a hood.

(8.) *Double pictures* are caused by small holes in the front of the camera.

(9.) *The picture is out of focus* in consequence of the ground glass being out of place; especially is this likely to happen when the ground glass is hinged and swings back.

(10.) *Unequal illumination* is sometimes caused by inequality in the thickness of the film; with double lenses, probably, from their unequal power.

(e.) Failures in development.

(1.) *A bright spot* at the place where the developer has been poured on, and lines shooting therefrom, evidence that the developer has been poured on too violently.

(2.) *Curved lines* are formed when the developer is not flowed evenly over the entire plate, each stoppage of the flow of the developer over the collodion surface being registered by a mark of the edge of the solution.

(3.) *The developer "crawls,"* i.e., does not flow evenly over the plate, but is repelled, as would be water on a greasy plate; this is generally caused by an excess of alcohol in the bath, and an insufficient amount in the developer to overcome the tendency to crawl. Too much alcohol in the developer will sometimes cause the same defect.

(4.) *Fogs* are often caused by too great strength of developer, or an insufficiency of acid in the developer, and also by developer that has not sufficient strength and energy.

(5.) *Flatness and lack of contrast* is the effect of over-development, and, as conducing to it, the use of too strong a developer.

(6.) *Harshness and want of detail* follow where the development has been prematurely arrested, or an inactive developer has been used.

(7.) *Failure* is often attributable to a "swilling" of the plate with a large volume of developer, whereby all the silver floating about in a free state is washed away into the sink and lost to the picture. This fault of development is mainly attributable to nervousness in the operator that he cannot get the plate covered without developing streaks, and he thus rushes into an equally grave source of failure, until the fault "degenerates into habit."

(f.) Failures in intensification.

(1.) *Stains* are caused by unequal intensification. If the plate is first flowed with pyrogalllic acid before the silver is added, these stains cannot arise.

(2) *Spots*, particularly when intensifying with iron and silver, are caused by insufficiency of alcohol—sometimes from an excess.

(3.) *A grey granular precipitate* is formed when intensifying with iron has been carried on after the solution has become "muddy."

(4.) *Bluish precipitate* in the shadows is caused by want of acid in the intensifier, and where an old pyrogalllic solution is used.

(5.) *Thick and heavy spots* are caused by continued pouring on of the intensifier at one spot.

(g.) Failures in fixing.

(1.) *Bluish or greenish colour of plate* is due to traces of the developer left on the plate, which, with cyanide of potassium, forms a green or blue precipitate. Wash the plate thoroughly before fixing.

(2.) *A greenish deposit in the shadows* shows imperfect dissolution of the iodide of silver. Remedy: longer time in the solution, or greater strength of solution.

(3.) *Thin spots* are caused by cyanide of potassium, where it has been allowed to eat into the film.

(4.) *Black streaks* are caused by insufficient fixation.

(h.) Failures in varnishing.

(1.) *A dull surface* is caused by too thin a varnish, or where the plate is not sufficiently warmed.

(2.) *Streakiness* is due to the plate being too hot when varnished, or unequal rocking during the setting of the varnish film.

(3.) *Breakage of the glass* is often due to unequal heating or sudden change of temperature.

(4.) *Detachment of the film* is sometimes caused by too great strength of the alcohol in the varnish.

(5.) *The film peels off* under the drying process. This is experienced especially when the negative has been much intensified. (Such plates should be flowed with a dilute solution of

Gum—office mucilage	...	...	25 parts
Water	...	...	75 "

before drying.)

(i.) Failures in retouching.

(1.) *Scratches* in the film are caused by removing the gloss to make a surface for the pencil before the varnish is dry; also by coarse particles in the pumice powder, or too rough handling.

(2.) *White spots* on the skin are the effect of unskilful stippling.

(3.) *Ivory-like texture*, and want of character in the face, and numberless grave faults, are the results of retouching, done not wisely, but too well.

Unnatural lights, characteristic lines, and marks worked out, &c., *ad. lib.*, too often seen in unskilful work, prove that retouching is the work only of the artist.

THE LAMBERTYPE.

BY W. E. BATHO.*

I BELIEVE it to be a part of our nature to rebel against a threat. Somehow it invites opposition. A request coupled with a threat invariably ensures unwilling compliance, and a search of these is force enough to carry out the penalty. While not laying any claim to infallibility, I propose to examine the value of the letters patent granted to Alexander Melville Clark, being a communication from abroad by Claude Leon Lambert. First, I will point out a few things that on some future occasion I may have to refer to that will invalidate a patent. If a patent be taken out in the joint names of two or more persons, and it be discovered that one or more of such persons had no part in the invention, the patent is void. The invention must be new; not used before in a business sense, even by the inventor. Again: if a specification claim as part of the invention something not new along with something new, it will invalidate the patentee's claim to that which was his own discovery, &c.

* Read before the Yorkshire Photographic Society.

I will now proceed to deal with the "Invention for an Improved Method of Retouching Photographic Negatives and Positives," for which letters patent were granted, dating from the eighth day of May, 1874, and leave the one under date of October 21, 1874, termed "Improvements in Producing Carbon Photographs," on the principle of its being bad generalship to attack two armies at once. I will now proceed to read the specification No. 1634, year 1874.

The concluding portion I will re-read:—"Having described the nature of the invention and the manner of performing the same, I declare that what I claim as the invention, to be protected by the hereinbefore in part recited letters patent, is the method of applying a semi-translucent sheet on each side of a negative or positive, and of quickly and readily retouching by operating on these surfaces; as herein specified."

Here is another extract from a paper read by Mr. G. Croughton, and published in the PHOTOGRAPHIC NEWS, December 24, 1873, and in the *British Journal*, December 19, 1873:—"In elderly people the lines and texture of the face is far too marked in the enlarged negative. This can be much softened and reduced by printing through tracing-paper. Strain over the face of the negative so interposing a thickness of tracing-paper between the sensitized paper and the negative. I always strain tracing-paper on the reverse side of the negative, as it serves to soften the printing, and is a capital medium for working upon."

Evidently, as Mr. Croughton occasionally used paper on the front of his negatives, and always on the back, and published it in December, 1873, it is clear he published a method in the latter part of 1873 whereby he occasionally used a semi-translucent sheet on each side of his negative.

You have now the material to enable you to judge as to the validity of the said patent. There is something noble about the man who takes out a patent, and has the courage to drop it when he finds he has been forestalled; but they who, under the most clear evidence, take a contrary course—why, one lacks expression for them sufficiently severe.

EMULSIONS.

BY H. J. NEWTON.*

THEORETICALLY, the fact of the soluble chloride remaining in the emulsion would be against their keeping indefinitely. There are some facts in connection with this theory which are, however, favourable. Collodio-chloride has long been made and sold as a commercial article with good keeping qualities. In all of these I think the same principle is involved, as they all contain chloride in excess, at least all that possess good keeping qualities. To all practical purposes, however, these emulsions leave nothing to be desired, either by amateurs or professional photographers, in reference to their keeping qualities or certainty of results. An emulsion that will keep in perfect working condition two months answers all the requirements that can be reasonably asked in reference to keeping. The bromide collodion can be made in quantities, and the amount of emulsion to be used in a few weeks made when desired. The bromide collodion will keep indefinitely, and is better fit for use after it is three or four weeks old. I have so far tried only one preservative, from the fact that I do not think it can be improved upon. It gives, with my developer, great brilliancy, and all the intensity required, not much, if any, more time being necessary after the developer is on to obtain full strength and detail than in the ordinary development of a wet plate. Several years since I found that a solution of laudanum in winter made an excellent preservative for the ordinary dry plate, enabling me to produce negatives of great brilliancy, lacking, however, sensitiveness. I then combined the laudanum with tannin, and thereby obtained a preservative which gave very sensitive plates, and, at the same time, retained the brilliant qualities of the laudanum preserva-

tive. With this compound I have combined the syrup of squills for emulsion plates. My formula for making this preservative is as follows:—

Water	13 ounces
Tannin	80 grains
Laudanum	3 drachms
Syrup of squills	1 ounce
Alcohol	2 ounces.

The tannin is first dissolved in the water, and the laudanum added. The adding of the laudanum to the tannin solution precipitates the gummy matter from the tannin, filling the solution with a light-brown flocculent mass. This should be filtered out before adding the syrup and alcohol. By this the means you will get a perfectly clear solution of tannin, which cannot be done while it contains the gummy matter which is precipitated by the laudanum; after filtering, add the alcohol and syrup. This preservative will keep perfectly good for at least a year, and can be used at any time, requiring only occasional filtering. The proportions given above are right for the emulsion plates when used wet. When dry, however, they are more sensitive, and to get the same brilliancy double the quantity of laudanum should be used—that is, six drachms—no other change being necessary. The developer which I have used in these experiments is composed of—

Water	2 ounces
Ammonia concoction	1 ounce
Bromide of ammonium	5 grains.

This I designate No. 1. No. 2 is pyrogallie acid, from three to six grains to one ounce of water, using it strong if I find my exposure has been under-timed. To develop, I proceed as follows:—After exposing the plate (we will take one five by eight inches), into a wide-mouth vial I place half-an-ounce of No. 2, and flow the plate after it has been thoroughly washed. If the exposure has been right, the image will soon appear; as soon as the outlines of the picture are visible, I pour off the solution of pyro into another vial, having previously been supplied with four to six drops of solution No. 1, and again flow the plate with the combined solution. The intensity of the negatives comes rapidly up to the required strength.

One inexperienced will be likely to get too much intensity, as the plates obtained by this process are, when fixed, of an olive-green colour, therefore very non-actinic. This colour can be changed to that of chocolate by flowing them, after fixing, with a weak solution of sulphide of potassium, not more than two or three grains to one ounce of water. This at first will appear to add to the density of the negative, but, if long enough continued, will reduce the negative. Negatives so treated have superior printing qualities. It may not, however, be advisable to treat them with the potassium sulphide if the negative appears thin enough when fixed, unless it be allowed to remain on a few seconds only. In pursuing these experiments, I have obtained many interesting results of minor importance, the details of which would make this paper too lengthy, and as some of them are incomplete, shall defer, only alluding to some of them until some other occasion. I am inclined to think a developer of iron properly prepared can be successfully used, also plain pyrogallie acid, and pyro and tannin. Since writing the above, my attention has been called to Mr. M. Carey Lea's formula for salting collodion for emulsion dry plates, the novel and important feature of which is the adding a small percentage of the iodide of aqua regia to the bromide collodion. Last fall I made a made variety of bromo-iodide emulsions, but in all of them made the iodide in excess of the bromide. Mr. Lea's idea of making a bromo-iodide emulsion with the bromide in excess struck me favourably, and I immediately gave it a trial, applying my principle of equalising the bromo-iodide of silver with a chloride as before, using only his formula for salting the collodion, which is as follows:—

Bromide of cadmium	8 grains
Bromide of ammonium	2 1/2 "
Iodide of ammonium	2 "

* Continued from page 344.

to one ounce of collodion. To sensitise this, I used nineteen grains of silver dissolved in alcohol in the usual way. Five hours after, I added two or three grains of chloride of cobalt. The next day it worked quite brilliant, but the intensity came up very slowly with the alkaline developer. I judged that more bromide salting was necessary. I found with this emulsion increased sensitiveness, but not to the extent indicated by Mr. Lea in his peculiar mode of working it. I adopted a new mode of developing, in which I dispensed with the alkali entirely. All the detail of the picture readily appears when the plain pyrogallie acid solution is flowed over the plate, after washing. When this development is carried far enough, instead of bringing up the intensity with the ammonia solution, I employed tannin and pyrogallie acid, six grains each in one ounce of water. This is flowed over the plate after the plain pyro, without washing it off, and when even action is secured, it is turned off into a phial containing eight or ten drops of a plain twenty-grain solution of nitrate of silver. The picture immediately comes up to the required strength, and gives much more harmonious results. The action in the weak lights being more perceptible, no longer exposure is necessary for this mode of development than for the alkaline.

The preservative which I have recommended is, as you will perceive, quite acid; the tannin has an acid reaction, and the syrup of squills is decidedly acid with acetic acid. I have not tried the squills in any other form; the extract is usually obtained by boiling in acetic acid, and the syrup of the drug-stores is made by adding sugar, *q. s.* I find some samples contain much more sugar than others. For this reason I intend trying it in some other form than that usually procured at the stores.

Plates prepared with any of these emulsions need no washing, but should be put into the preservative as soon as the emulsion is sufficiently set.

In conclusion, I would remark, that one formula with which I experimented showed signs of fogging after ten or twelve days. To this I added two grains more of chloride cobalt. The next day it had recovered its original brilliant properties.

THE PRACTICAL PRINTER IN AMERICA.

XXXI.

PRINTING-IN FALSE BACKGRUNDS.

This is a well-known and valuable dodge among photographic printers. It is worked as follows:—First print a proof of the negative as it is, said proof being printed on a piece of paper full as large as the desired size of the finished print. When printed, lay the proof on a glass, printed side up, and, with a very sharp knife, follow the figure exactly on the margin of both the face and draperies. Not the least possible variation should be made, or the resulting print will surely show it. No carelessness will answer at all here—in fact, every particle of the printer's attention should be given to his work, from the beginning of the cutting until he is through. Follow the nooks and turns of the draperies and hair, cutting out each curl faithfully. Avoid all sharp angles, and let all of the cutting be in curves when corners are turned, and more or less wavering when following the line of the hair. Particular attention should be given when cutting in around the face and neck; this is especially the case in the cutting out around the cheek bones. If the printer thinks he can improve on the cutting-out if he were to cut another print, then print another one and do so. After a while the beginner will succeed splendidly.

After the background is cut out, the next process is the pasting it on the back of the glass, which process is one of extreme care. Do not in pasting it on apply paste to the

whole print, but to the two upper corners of the back part (i.e., the glass side) of the negative. It is often placed on the varnished side of the negative, but this, unless done by a person of considerable experience, is very risky, as failure will be certain for the beginner, for it is often so with the experienced printer. When it is desired to place the cut-out on the varnished side of the negative, then in printing in the background the mask is placed close to the paper, instead of being placed on the outside of an intervening glass, as described below. I have obtained fine results in the above way, but, as it is much more difficult than the way I have partly given, I very seldom do it. When about to paste the background on the back of the negative, turn over the corners of the paper, which are to touch the corners of the negative where the paste is placed, as the neglect of it will occasion some little trouble when adjusting the print to the negative.

When it is desired to adjust it, rest the negative on a window-sill and look through it to the light, and then the printer can more easily and surely do what he wishes. When adjusting, keep the paper smooth, and when properly placed, turn down the corners and press them in close contact with the paste. Dry under pressure, in the sunlight or by the fire, so that the paper will not contract out of place while drying, which it would be likely to do if proper means were not taken to prevent it from doing so. When dry, place it out to print, either plain or in a vignette style, as ordered (after having placed the sensitive paper under the negative), and print in a strong diffused light.

If the print is too long printing, the thickness of the glass and the slowness of the printing will cause the negative to print out too far under the masked background. When in the making of the mask the printer were to think that such will be the result, then make allowance for the thickness of the negative and for the weather, and then, when necessary, cut a trifle inside of the hair and such other dark places that will print quickly, and consequently feather or blend out beyond the figure on to the background. Do not touch the face, however.

If the printer were to cut a trifle inside, as written above, then it will feather out softly to just about the right distance, and not print in any of the background.



Now take a suitable size glass, fully as large as the finished print is to be (see fig.) and lay it on the print, and then paste the mask (the figure which was cut out of the background mask) by applying a dot of the paste at one place on the outside of the glass, thus having the thickness of the glass between the mask and the print.

Place the print on a flat printing-board, and match the cut-out attached to the glass to the print, and then place it out to print in a strongly diffused light if the picture is to be plain; but if it is to be a vignette, then place the vignette block over the whole, being careful not to move the glass. Place a tissue-paper over the vignette block, and then place frame and all out face to the sunlight.

If the background is to be a plain one, print either darker or lighter than the face of the figure. If the figure is to have a vignette background, then in the majority of cases have it light, and also have a soft halo to it.

(To be continued.)

OLD ENGRAVINGS.—Woodcuts, or printed matter, that have turned yellow, may be rendered white by first washing carefully in water containing a little hyposulphite of soda, and then dipping for a minute in Javelle water. To prepare the latter, put four pounds bicarbonate of soda in a bottle over a fire; add one gallon of boiling water, and let it boil for fifteen minutes. Then stir in one pound of pulverized chloride lime. When cold, the liquid can be kept in a jug ready for use.

The Photographic News.

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A NEW ACCELERATOR.

SOME months ago allusions were made in various paragraphs in the photographic journals to a new accelerator employed by a Continental photographer, who found that by its use he was enabled very materially to reduce the exposure in the camera. This acceleration was gained, it was stated, by the addition of methylated spirit to the iron developer. The statement did not gain much credence in this country, chiefly from the fact that almost every photographer habitually so added methylated spirit, using it as a matter of economy in preference to pure spirit, without perceiving that it exercises any accelerating influence. Special comparative experiments with pure spirit and methylated spirit failed to show that the latter gave any additional energy or new quality of any kind to the developer. We pointed out some time ago that an error probably existed in the original paragraph, which referred to "methylated" spirit, inasmuch as the compound vended under that name in this country was unknown in Continental Europe,* and that methylic alcohol or wood spirit was doubtless meant. Experiment with addition of this substance was made without any advantage being discovered. Subsequently, however, a more precise statement of the formula employed reached us, from which it appeared that it was not simply methylic spirit which was added, but a methylic compound formed by distilling the spirit with sulphuric acid and peroxide of manganese; and for this addition a very definitely accelerating action was claimed.

In another column we give details of a series of experiments by Herr Warnerke with the methyl compound in question. Carefully following the formula of Mons. Alexandre, which we published some weeks ago, and testing the iron developer so prepared with a solution of iron made at the same time, with the addition of acetic acid instead of the methyl compound, he finds a decided advantage gained, although not to the extent which has been described in Continental journals.

The effect of the methyl addition in well exposed plates, judging from examples with which Herr Warnerke has favoured us, is increased delicacy and detail, without any loss of vigour; whilst, in cases where the plate has been insufficiently exposed to give good results on the half developed with the ordinary iron developer, a marked advantage is manifest on the half developed with this solution containing the methyl. Thus much advantage is very certainly gained in early experiments. There may be other possible gains yet to be secured. Herr Warnerke is

* Methylated spirit, as most of our readers know, is simply ordinary spirits of wine with the addition of ten per cent. of wood spirit. The object of this addition is to render the spirit unfit for drinking purposes, without injuring it for use in the industrial arts. When so admixed with wood spirit it is not charged with ordinary duty payable upon all potable alcoholic spirits.

experimenting with an iron developer containing methylal in dry plate work with much promise of success. The alkaline method of developing, successful with bromide plates, is less suited to those containing iodide of silver, and it is probable that any agent which adds to the energy of the iron developer will best meet the conditions required in iodide plates.

The compound resulting from the distillation of wood spirit with sulphuric acid and peroxide of manganese has been named methylal, and corresponds to acetal in the ethyl series. It has a reducing action on silver salts. The process of manufacture is not difficult, but requires some care. It is probable that should the addition in further examination prove sufficiently useful, it will be prepared by photographic chemists, and supplied ready for use.

URANIUM IN THE NITRATE BATH.

DURING the recent discussions as to the influence of nitrate of uranium in the negative bath, in the course of which its action as an accelerator was affirmed and denied with quite as much urgency as the courteous regard of each of the disputants for the other rendered permissible, we suggested that the solution of the difficulty, presented by the discordant evidence, would probably be found in the existence of some conditions unrecognized in the operations of one or other of the experimentalists. A letter from Capt. Waterhouse, which we publish on another page, offers confirmation of this suggestion. The experiences of Capt. Waterhouse support, in some degree, the conclusions of both disputants. When nitrate of uranium was added to the silver bath for ordinary wet plate operations with the usual bromo-iodized collodion, it was in the hands of Captain Waterhouse, as it had proved in the hands of Mr. Werge, a retarder rather than an accelerator; whilst used in like manner with dry plates, it gave, in the hands of the latter gentleman, as it had with Colonel Wortley and Captain Abney, greater rapidity and finer results. Colonel Wortley has also found advantage from its use with wet plates; but the precise conditions have apparently not been noted, as they have not been described. Captain Waterhouse notes the fact that the collodion used in the dry plates contains a larger proportion of bromide than that used in the wet process. So far as we remember, Colonel Wortley habitually employs a much larger proportion of bromide in his collodion for the wet process than is customary, and it is possible that in this fact may be found the explanation of the contradictory evidence which has been described. At any rate, here is definite independent evidence from an able experimentalist of the value of the uranium salt in dry plate operations, and it is not impossible, when the rationale of its accelerating influence on dry plates has been discovered, that it may be found equally applicable in the wet process.

METHYLAL AS AN ACCELERATOR.

BY LEON WARNERKE.

In the photographic journals of the last two or three months attention has been called on more than one occasion to the use of a certain addition to the iron negative developer, having for its object shortening of the exposure in the camera. It promised so well when first described, that I considered it my duty to try it for my own satisfaction.

At first I met only with failure, in consequence of contradictory and erroneous descriptions of the substance employed; but the last and most detailed formula gave me opportunity of forming a more definite opinion, and the result of my observations I communicate now to the readers of the PHOTOGRAPHIC NEWS. In my experiments I followed the formula given in these pages, viz:—

Sulphuric acid	...	...	3 parts
Water	...	...	2 "
Wood naphtha	...	...	2 "
Peroxide of manganese	...	...	3 "

These were put into a glass retort and distilled over a very slow fire. Distillation was interrupted when distillate amounted to three-fourths of the quantity of the wood naphtha used. A colourless liquid of strong but not unpleasant ethereal odours was obtained. I next prepared a solution of

Protosulphate of iron ... 15 grains
Water ... 1 ounce

And one part of it was acidified with fifteen grains per ounce of glacial acetic acid, while to another portion was added five per cent. of the new distillate, which I shall refer to as methylal.

A glass plate prepared in the usual way, after exposure was cut in two; one half developed with acetic iron developer, and the other with the new developer.

After careful examination of several negatives obtained in the way described, I came to the conclusion that the new developer is superior to the old one, in the following points:—

1. It shortened exposure, though not to such an extent as was originally described, but still quite visibly on every negative, and more distinctly on those that were under-exposed.

2. The new developer does not require addition of alcohol to avoid greasy lines. It is astonishing how a very small quantity of methylal confers on the developer the property of flowing uniformly on the collodion surface.

3. With the new developer, not only the image appear quicker, but the development can be prolonged much longer without danger of fogging, and by this prolonged development secures more details, whilst preserving perfect clearness.

4. At the end of a month after the preparation of the new developer, it is perfectly colourless, while that simultaneously made with acetic acid is already brown, a fact which speaks strongly in favour of the keeping qualities of the developer with methylal. Up to the present time I am so pleased with this new developer that I am decided not to use any other in my wet process practice. The formula I now use stands thus:—

Protosulphate of iron ... 1 ounce
Water ... 40 ounces
Methylal ... 2 „

Now as to the name and symbol of the new substance. It is known to the chemist by the name of methylal. On the authority of Pelouse and Fremy, methylal has for symbol,—

$C_6H_8O_4$	
C_6 ...	450.00
H_8 ...	100.00
O_4 ...	400.00
	<hr/>
	950.00

It is soluble in water, alcohol, ether, and in wood naphtha. Its boiling point is 42° Centigrade = $107^\circ.6$ Fah. Density 1.855.

Alcoholic solution of potassa transforms methylal into formate, and chlorine into the sesquichloride of carbon C_2Cl_6 .

Methylal may be considered as three equivalents of methylic ether, in one equivalent of which one equivalent of oxygen replaces one equivalent of hydrogen; or it can be assimilated to acetal, and considered as two equivalents of methylic ether and one of methylic aldehyde.

AN IMPROVED FORM OF ARCHER'S CAMERA.

BY L. MACDONA.

DOUBTLESS many of your readers have seen the article on Archer's camera in the YEAR-BOOK for the present year. On reading it some time ago, it occurred to me that it might be materially improved upon, its only fault being the difficulty of manipulating a plate in so small a space by means of sleeves in the covering, which impede the full

play of the hands, especially when so high (I may say on a level with the face). I myself prefer (as doubtless most do) to have the hands as free and unconstrained as possible, in order to work in comfort and get good pictures. For this reason I here contrived a slight alteration in the above form of camera which fulfils the above conditions, as not having sleeves, nor the equally distressing method of having to look at the plate through a hole in the camera; it enables the operator to develop, &c., in perfect comfort, and with great ease. Having thus made a few remarks on its advantages, I will describe it as well as I can, though this will almost be unnecessary with the rough sketch which I have drawn. It is simply an ordinary camera about a foot



square (this size will do well for half-plates), bellows body. The back is a sort of shallow box set up on its side, to the front of which, inside, an ordinary half-plate carrier (or whole, as the case may be) is fixed, its slide being a little longer than usual, so as to allow of its being drawn up from the outside of the camera. A light roof is hinged to the top of this camera back, measuring also one foot square, in which is cut a window as seen in the figure; this roof is kept up by a couple of small rods each side. The base-board of camera is hinged so as to fold up. The focussing is done in the usual way; the back being secured by a screw running in a groove in the baseboard when set up, the black twill covering is thrown over the back and roof, and the operator tucks it in to exclude light, and can then manage all the operations in comfort. The camera back, if made rather wide, can be utilized for holding bath and chemicals, the whole packing up into a space (say) $12 \times 12 \times 8$. The above adaptation will be found most convenient in the field, and without the weight and bulk of a developing box or tent and other etceteras taken on field excursions.

ON PHOTOGRAPHIC IRRADIATION.

BY CAPTAIN ABNEY, R.E., F.R.A.S., F.C.S.*

THE most frequently received notion regarding photographic irradiation (i.e., an increase on development of the apparent size of the image of a luminous object when photographed against a darker body) is, that it is due to simple reflection of the incident rays from the back of the plate. This view is quite untenable, excepting in the case where the incident rays fall at an angle with the perpendicular to the surface of the plate. If a bromo-iodized film be sensitized in an ordinary nitrate of silver bath and be examined with a microscope, using a high power, it will be found that it consists of particles of bromo-iodide of silver separated by considerable intervals

one from the other. The collodion vehicle is illuminated with that peculiar greenish-yellow tint which always marks a film of this description. A few simple experiments will show that this colour is entirely due to the light reflected from the particles, and that it is not due to the collodion itself.

When the construction of the sensitive film is taken into account, the cause of irradiation (or blurring of the image) is not far to seek.

It is these small particles that cause the film to be translucent, and prevent its being transparent. Where there is transparency there must be a scattering of the incident rays.

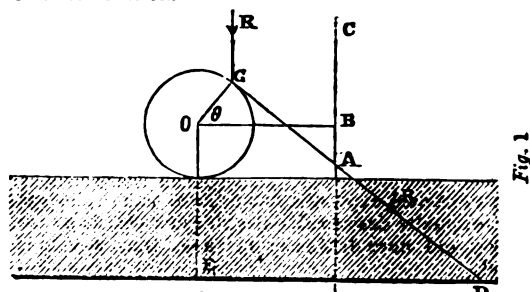
These particles are quite measurable; hence we cannot treat the question as if they were small fractions of a wave-length. In fact, they are several times larger in diameter than the greatest wave-length; and as we have to deal with the smaller wave-lengths, we may treat the question as a case of simple geometrical reflection. At any rate, the dispersion caused would not interfere with the general result.

The physical forms which the particles take are not quite apparent. Being in an amorphous state, it will not be unfair to assume that they are generally of the shape of a spheroid. For the sake of calculation, we may also assume that each particle reflects a definite proportion of light. This hypothesis will be found not to affect the aspect of the problem, if the refracted rays be traced after transmission through the sphere, in a similar manner to that in which it is proposed to trace the reflected rays. In any case it is only assumed that an approximate solution can be obtained.

Let us consider the action of one particle, and, for the

sake of simplicity, let us take it to be one in contact with the surface of the glass plate on which the film rests. The case where the minimum irradiation will be produced is that in which the incident ray falls perpendicularly on the surface. First, on these hypotheses let us examine the intensity and duration of the light that would fall on the plate.

As the general direction of the light is perpendicular to the surface, it is evident that by far the largest proportion of it must fall in the same direction on the particle under consideration.



Let r = the radius of the particle.

θ = the angle of incidence of R , a ray of the pencil falling on it.

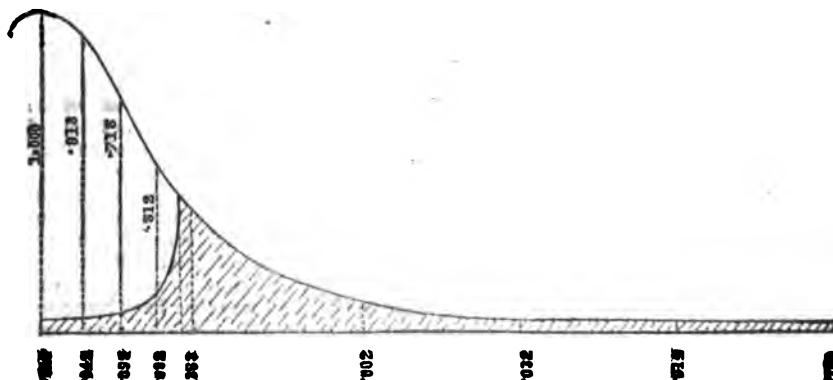
Let $A E$ represent a section of the glass plate.

Let $E D = x$, and t = thickness of the plate.

Since $E G D = 2\theta$,

$$\therefore x = r \cos \theta + (t + r + r \sin \theta) \tan 2\theta.$$

From the question before us it is manifest that θ cannot



be greater than $\frac{\pi}{4}$.

When r is small in comparison with t ,

$$x = t \cdot \tan 2\theta.$$

$$\frac{dx}{d\theta} = \frac{2t}{\cos^2 2\theta}.$$

Now the quantity of light falling upon a very small surface at G will be distributed on a small surface about D .

The small surface at G may be represented by

$$r^2 \sin \theta \cos \theta \cdot 2\pi \cdot \delta\phi$$

(where ϕ is the angular measure taken parallel to the surface of the plate).

The small surface at G will be

$$x \delta x \cdot \delta\phi = t \cdot \tan 2\theta \times \frac{2t}{\cos^2 2\theta} \delta\theta \cdot \delta\phi.$$

If I and I' be respectively the intensities of the light reflected from G and falling on D ,

$$I' = \frac{I r^2 \sin \theta \cos \theta}{2t^2 \tan 2\theta} = \frac{I^2}{4t^2} \cos^2 2\theta.$$

Since $x = t \cdot \tan 2\theta$,

$$I = \frac{I'^2 t}{4} \cdot \frac{1}{(t^2 + x^2)^{\frac{3}{2}}}.$$

For the sake of illustration, the accompanying curve has been constructed showing the general relation between the intensity and angle of incidence on the bottom surface of the plate. The ordinates represent the intensities. For the abscissae the thickness of the plate has been taken as the unit of measure.

The solid of revolution formed by the area rotating round the axis of y would give the projection of the pencil of rays incident on the particle multiplied by its intensity. Not all these rays will be reflected back; only those which fall at and beyond the visual angle will do so. Calculating according to Fresnel's formulae the amount of light that would be reflected for each angle less than the critical angle, we get the curve which bounds the shaded part of the figure. The area between the two curves shows the amount that would pass through. The refractive index has been taken as 1.5.

An examination of the figure shows that if a ray of light fall on the film, on development a ring *might* be formed round the image at a distance from it equal to $2t \cot \chi$, where χ is the critical angle; on the inside it would be shaded off more abruptly than on the outside. If then a cylindrical pencil of rays strike a film perpendicular to its

• The refraction index of collodion and the glass may be taken as equal.

surface, a similar detached annulus would result, provided the diameter were $< 2t \cot \alpha$.

To ascertain if actual results held with the theory, the following experiments were made:—

(i) A short-focus lens (about 6 inches) was employed to form an image of the sun on a sensitive plate whose thickness was approximately $\frac{1}{12}$ inch. On developing the image a well-defined annulus was obtained, the most intense portion being equal to the sun's diameter. The shading-off was that described above, and answered to the theory.

(ii) A plate of double the thickness of the foregoing was similarly treated. The mean diameter of this annulus was double that of the last.

(iii) Two plates, similar to that used in (i), were next experimented with. Each one carried a sensitive film. The film of the bottom plate, 1 (fig. 3), was separated from the surface of the top plate, 2, by a strip of thin card to prevent contact. On developing them the ring was obtained on the first plate, and a diffused image on the second.

Throwing the two images on a screen, and taking the intensities by the method described in my paper in the *Philosophical Magazine* for September 1874, I obtained two curves which, when the sun's diameter was taken into account, as also the irradiation due to the cause which I shall presently explain, gave a near coincidence to that obtained by this theory. It should be noted that the image obtained on the bottom film was that due to the light refracted and not reflected. In the films employed, about $\frac{1}{10}$ of the actinic rays were transmitted through the first plate, and the amount of reflection from the sensitive film itself was nearly $\frac{1}{2}$ of the whole light.

(iv) With dry plates I also made other experiments. I cut small holes and slits in platinum foil. Placing these in contact with the plate, it was exposed to direct sunlight. With the former the rings were obtained as before; with the latter parallel lines joined with semicircles. This gave sufficient evidence that nothing in the lens used in (i), (ii), and (iii) could cause the effects produced.
(To be continued.)

Correspondence.

URANIUM IN THE BATH.—IRRADIATION, ETC.

SIR.—I notice in the last *News* that a discussion is going on as to the advantage or otherwise of the nitrate of uranium in the negative silver bath. Some experience I had last year while preparing for the Transit of Venus may be worth recording.

I made up a bath with about 40 grains of nitrate of silver and 10 grains of nitrate of uranium to the ounce, to be used as suggested by Captain Abney for working his beer-albumen process for sun pictures. With ordinary bromo-iodised collodion, used wet and developed with iron, I found a very great decrease of sensitiveness. Thinking that this might be due to the acidity of the nitrate of uranium, I neutralised the bath with oxide of silver, but still it had the same effect. With dry plates, however, the case was quite different, and I found the plates sensitised in the uranium bath more sensitive and of generally better quality than those sensitised in the silver bath alone.

The collodion for the dry plates contained more bromide than the ordinary bromo-iodised collodion, which may have had some effect on the result.

I may also mention that I could not succeed at all with Capt. Abney's beer albumen process, though I tried over and over again, both here and at Roorkee, with several different collodions. The plates were always very insensitive, though I followed out the instructions carefully.

With Mr. Davies' formula for the beer albumen mixture, in which nitrate of silver is added to the beer, I obtained greater sensitiveness and better results. I prefer, however, to

use some substance of known composition, likely to be always the same, rather than beer, of which almost every sample is different.

I obtained the best results with dry plates for sun pictures with a coffee albumen process. But I also obtained some excellent pictures for ordinary work with laudanum alone, or mixed with starch or gum, and also with tea. For the transit, however, I used the ordinary wet process, though a few coffee albumen dry plates were taken.

In making some experiments on irradiations lately, preparatory to the eclipse, I came across a discovery which appears likely to be useful. I was trying the effect of stained films in reducing irradiation, and had prepared some orange collodion by adding a small quantity of Judson's orange dye to the ordinary bromo-iodised collodion. On developing I was surprised to find the picture come out exceedingly dense, both when developed with pyro and with iron. On afterwards trying the stained collodion for a view, I found that although the exposure was slightly increased, there was a great gain in intensity, and the general quality of the negative was much improved, the shadows being particularly bright and clean.

I therefore used the stained collodion for preparing the plates for the coronas during the eclipse, though, unfortunately, as it turned out, the opportunity of testing its value as a preventive of irradiation on this occasion was lost, from bad weather; and I used it for views and groups at the Nicobars with excellent results.

I do not know the chemical composition of this dye, or how the effect is produced—whether chemical, or merely the result of the yellow colour. I once noticed something of the same kind when using some dry plates which had been treated with a solution containing turmeric. A remarkable increase of intensity was gained with the alkaline developer.

The orange dye seems to do no harm to the bath. A bath that I had in use at the Nicobars was left in the travelling holder, but was in excellent order when tried here some weeks after my return.

At the same time, I made experiments with bromo-iodised collodions stained with other dyes—red, green, and blue—but nothing noteworthy was observed.

For the eclipse I had also prepared some plates by Sutton's moist bromide process, from which I anticipated great sensitiveness, and some good pictures. The process seemed to me an excellent one, giving great sensitiveness, and a perfect freedom from blurring or irradiation, though the plates were not backed or stained. I have had no leisure lately to prepare a paper on the transit or the eclipse, but I hope to do so soon.—Yours truly, J. WATERHOUSE.

[It is probable the orange dye in question is one of the aniline series, known as phosphine or crespaniline. We may be able to ascertain definitely.—Ed.]

DR. VOGEL AND THE ECLIPSE EXPEDITION.

DEAR SIR.—I see from the English newspapers that my letter from the Indian Ocean, dated March 14th, where I complained of the lack of instruments, has excited much mortification in England. I am sorry that this letter, which was intended as a private one, was published by a mistake in the *Mittheilungen*. The letter was written under the first impression of helplessness, and I confess that I consider the matter now more calmly. I did not get the instruments I expected, but I found other things which enabled me to construct a substitute for a telescope, and therefore I was not finally so helpless as it seemed at first. But I am a little surprised to read the question as to who invited me to take part in the English eclipse expedition, and who made a promise to deliver me instruments. I expected that this would be known, but I see that is not the case. To remove any distrust, I publish the following fact.

I got a letter from Dr. Schuster (afterwards chief of the Siam eclipse party), dated January 3rd, asking me whether I would take part in an eclipse expedition to India, pro-

posed to the Royal Society. Schuster adds:—"Upon your answer depends much the acceptance of the proposition;" and requested me to telegraph my answer to Mr. Lockyer, Royal Society, Burlington House.

I answered by telegraph in favour of the project. On January 15th I got the following telegram:—"Royal Society invite you; have you telescope with clockwork?—Lockyer." I replied: "No, I have only a spectroscope." January 16th I got the following telegram:—"We have a telescope, but you must come here to adjust your spectroscope.—Schuster." I wrote Dr. Schuster that I could not come to London, and sent him my spectroscope, with a drawing how to attach it to the telescope. Dr. Schuster promised me, by letter (without date) that he would arrange all after my direction.

In the first days of February I got the official invitation from the Royal Society, dated February 5th, written from the Secretary, whose name I cannot read. The letter bears the printed superscription, "Royal Society, Burlington House," and the number A1176.

Some days afterwards I got a letter of the same style from the same writer, wherein he sent me, "at the request of the committee," a cheque for £20 to pay the travelling expenses from Berlin to Venice and back, and advised me that the P. and O. agent was ordered to send me a ticket for Ceylon and back. The same week I received the ticket.

On February 8th Dr. Schuster wrote me that he had got for me "two pretty lenses" from six inches diameter, and added: "The best style of fitting them we will discuss on board of the steamer, where we have a clever mechanic." The end of February I met Dr. Schuster in Suez, and during the voyage learned that the "two pretty lenses" were not much more than looking glasses with chromatic and spherical aberration; no telescope, no clockwork, &c.

Anybody will easily understand that I was disappointed at this fact; but, as I mentioned before, I could construct, with a rapid rectilinear lens from Lord Lindsay, a mirror from Mr. Lockyer, and a stand from Mr. Pedie, an instrument which would work instead of a telescope, and the lack of such a one could only trouble me personally.—Faithfully yours, H. VOGEL.

DEAR SIR,—In the *British Journal* of July 16th I find a letter from my colleague, Mr. Meldola, on the late eclipse expedition.

I beg to remark that some of his assertions are already explained by my letter sent you for publication some days ago. Anybody will easily understand from that letter that the perfect Dallmeyer lens Mr. Meldola mentions is quite other than those imperfect "pretty lenses" bought for me especially for expedition purposes from Dr. Schuster, and lost afterwards in Ceylon. Mr. Meldola knows this fact very well, and if he loves the truth, he will be so kind as to confirm it.

As I wrote my private letter in Ceylon complaining of the lack of instruments, I knew nothing at all about a Dallmeyer lens, which was found a fortnight afterwards as the English instruments were unpacked on the Nicobar Islands.

I think it further very curious for my honourable colleague to declare that a driving clockwork is not necessary for taking the corona spectrum. If so, I beg to ask him why he and other observers took with them heavy instruments with clockwork? If not necessary, he could have left his driving clock home.

The opinion of Mr. Meldola that my spectroscope is totally unfitted for use with a telescope is only his own. The heavy stand could be removed, and the upper part easily attached to a telescope. I had sent my spectroscope in January to London, at the request of Schuster, to be attached to the promised telescope, but nobody wrote me "that the instrument is totally unfitted for use with a telescope." On the contrary, Mr. Lockyer wrote me, "Your instrument would be splendid attached to an equatorial." The letter is still in my hand.

Finally, Mr. Meldola expresses his amazement that I have charged "Englishmen with having learnt how to photograph a spectrum from my writing."

If I could have known before that my private letter would be published, I would have used other expressions. I beg, however, to point out that I was the first who showed quite a new manner of photographing the yellow and red part of the spectrum.—Faithfully yours,

Berlin, July 18th.

H. VOGEL.

PROFESSION OR TRADE.

SIR,—We have just received from a manufacturer of albumenised papers a request which, as it comes in the circular form, has, no doubt, been forwarded to many other photographers: the request is simply that we will send a collection of our best photos. to the manufacturer to be exhibited by him at the Philadelphia Exhibition in 1876, not as specimens of our photography, but as samples of his paper! We need hardly say that such a request would meet with no favour in our eyes. But our present object in writing to you is to ask other photographers who may receive similar applications whether they do not think that a very serious degradation of their art would be involved by compliance with this request.

Much has been written of late on the status of photography as a profession. There seems an excellent chance here for photographers to show whether they will maintain the dignity of their art, or will, for the sake of a few shillings, contribute to a puffing advertisement which would do more to degrade the art in the eyes of the public than anything we know of. We cannot imagine any greater affront that could be offered to an artist than to suggest that the success of his pictures is due not to his personal skill, but to the excellence of the material with which he works.

As a parallel case to this, fancy how it would be to annotate the Royal Academy catalogue thus: "No. —. This picture was painted on the excellent cream-tinted canvas supplied by Mr. So-and-so. "No. —. The sky in this picture was painted with the new double refined cerulean at £15 10s. per ounce." Would the academicians—or, indeed, any painters who have any respect for their art—admit of such a use being made of their pictures?—Yours truly,

H. P. ROBINSON & N. K. CHERRILL.

THE LAMBERTTYPE PROCESS.

SIR,—After several weeks of anxious waiting for information as to what constituted the Lambert patent process, I am pleased to see the specification published in your last number*; also to find that its sole claim to originality consists in enclosing the negative within two sheets of transparent tracing-paper, and working thereon both on the face side of the negative, as well as the reverse side, with a pencil, crayon, powder, or an impalpable galvano-plastic powder.

For the benefit of photographers, and for the information of M. Lambert, I find the following appears in a paper read by Mr. G. Croughton before the members of the South London Photographic Society on December 11th, 1873 (see *PHOTOGRAPHIC NEWS*, December 24th, 1873):—

"In elderly people, the lines and texture of the face are far too marked in the enlarged negative. This can be much softened by printing through tracing-paper. Strain the tracing-paper over the face of the negative, so interposing a thickness of tracing-paper between the sensitised paper and the negative. I always strain tracing-paper on the reverse side of the negative, as it serves to soften the printing, and is a capital medium for working upon with the pencil to strengthen the high light."

If this is not the sum and substance of the invention claimed by the Lamberttype Patent, perhaps M. Lambert will kindly inform photographers wherein his specification differs from the above.—I am, yours, &c., R. SLINGSBY.

Lincoln, July 20th.

SIR,—Like many other readers of your valuable periodical, I was much interested by the announcement of Mr. Lambert's arrival and of the advantages of his patent process. I believe I have purchased without exception everything of the kind that has been brought out, and I was anxious to see the demonstration of the inventor. I was much pleased with Mr. Lambert, from whom I had a hearty welcome, and found him surrounded by a circle of photographers who, I was informed, were subscribers to the new process. I perceived that they were gentlemen who had not very closely followed the course of modern improvement in photography. Mr. Lambert is a very skilled and able manipulator, with great rapidity of action and decision of movement, and it is a real pleasure to see so able a man at his work.

Having witnessed the demonstration, which occupied several hours, I put the question: "And what do you claim as novel in your patent?" The reply was prompt and emphatic: "The paper on each side of the negative." He continued: "You may use it on the back, or on the front, and welcome; but if you employ both, you will be liable under my patent, and I shall be bound to protect those who take licenses from me."

Sir, I have daily used this process for a year and a half in my business, as can without difficulty be proved, and have from time to time given information to others on its use. On the 11th of December, 1873, a paper was read before the South London Society in my presence by Mr. George Croughton, and published in your issue of the 24th, in which he describes his method of enlarging and improving negatives, and, in terms which cannot be mistaken, points out the use he makes of paper on both sides of the negative. Can it be necessary to go further into it? Surely, sir, your oft-quoted dictum about priority of publication settling the invention exists in full force here. I maintain that this system of double papering was invented certainly on the 11th Dec. 1873, which was long anterior to Lambert's patent. This process was given to the body of photographers, and it is, and should remain, free to all to use. I speak now with some feeling as one who has during many years communicated what I know without reserve, and without patenting, giving to all free use of what I had originated.—I am, respectfully, SAMUEL FRY.

DALLASTINT.

SIR,—I think I can safely say I have solved the problem of how to obtain from photographs from nature or drawings in flat tints blocks printable satisfactorily at the ordinary type press, and without any aid whatever from the engraver except trimming the margin of each block—a purely automatic process.

Just ten years ago I began my experiments for this special object, and obtained at that time some very promising results. I had still some practical difficulties to surmount, and was compelled by other work to keep the process in abeyance. Every now and then—not being able to get it out of my thoughts—I have taken the matter in hand; but it was not till the 14th of this month that I was able to dance and cry "Eureka! Eureka!" Early next month I shall have my specimens out, and will submit them to your criticism.

"Dallastint"—as I propose to call the new block process, as well as my old photoelectric process, of which it is an offshoot—is a species of aquatint, yielding almost microscopic detail and gradations, from deep black to the most delicate tint printable. Although letterpress printing can never rival copperplate work—by a suitable modification Dallastint becomes a copperplate process—yet the new block method will come very near to it, while it will, I think, be found much superior to chalk-work in lithography, the grain being finer than the human hand can produce with the crayon on a grained stone. The process has the further advantage of being able to reproduce, either same size or otherwise, not only chalk tints, but mezzotint, ordinary aquatint, and drawings in washes of indian-ink or sepia. It also yields valuable blocks for colour printing.

I should hesitate to make these glowing announcements thus publicly did I not feel now certain from actual results that the process is no longer crude, but is *un fait accompli*, and that I have completely mastered the principles on which it is based and the mode of working. In photographic engraving I have never contented myself with results, but have always searched after "the reason why," so as to be able, as Bacon phrases it, "to compel Nature." I hope soon to submit proofs of my success with the good dame.—I am, yours, &c., DUNCAN C. DALLAS.

PHOTOGRAPHS OF THE DROWNED.

SIR,—In your issue of the 9th, page 325, you have a paragraph as follows: "There does not appear to have been a professional photographer at Scilly," &c., &c. Will you kindly allow me to say, for the information of your readers, that the statement is based on error. I beg to say that neither the clergyman nor the lord of the manor are photographers in any sense of the word. There was not a single body of those recovered from the "Schiller" photographed by anyone, consequently their photographs were not and could not be placed on their graves. The only ones photographed were the chief officer and second officer, whom a friend of theirs brought to me, and these two only of the living were photographed. I confess that on looking at the bodies I felt that it was a case where the aid of photography ought to have been called in, but no one in authority gave any order, and any suggestion coming from me would have appeared like soliciting an order, than which nothing could be so abhorrent to me.—I remain, sir, very faithfully yours, JNO. GIBSON.

[Our contributor must have been, it would seem, misinformed in some points. The origin of the error we do not know, but remember to have seen similar statements to those of our contributor in the accounts of the wreck appearing in the daily press. The observations of our correspondent strongly confirm the statement as to the propriety and importance of photographing the bodies under such circumstances.—ED.]

Proceedings of Societies.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL of this Society was held on Monday, the 12th inst., LORD DE ROS in the chair. The minutes of the last meeting having been read and confirmed, the following members were elected:—John Adams, Esq., jun.; George Whitla, Esq.; Miss H. H. Lane; Wm. Armstrong, Esq., jun.; F. J. Wills, Esq.; Wm. Wilkes Unett, Esq.; A. A. Mantell, Esq.; Wm. Vanner, Esq.; Miss Louisa S. Cox.

Mr. GLAISHER then read his annual report, of which the following is an abstract:—

It has been my agreeable task for fourteen years, with, I think, only one exception, to compliment the members of this Association in my annual report on the excellence of their contributions. This year, however, I am sorry to be compelled to complain that, although one of our members (Mr. J. W. Richardson) has contributed a large number of 16 by 12 pictures, equal, if not superior, to anything previously contributed, yet the pictures as a whole are below the average. This is owing to some of our best workers not having been able to send any plates this year. It is, however, gratifying to see the works of many new members, and note that we have a goodly number of applicants to elect. Mr. Hobson is still as good as ever in his composition, and Captain White has sent a number of cloud studies which, but for some spots and stains, would have been perfect. Captain Smith has contributed a very large number of most interesting Indian views; and Col. Locke's pictures are still excellent. The Hon. Noel Waldegrave has sent some small pictures which are exceedingly good.

The following prizes were awarded:—

J. W. Richardson, Esq., for Nos. 6a and 10a—First Prize—a silver goblet, value £8 8s.
J. W. Richardson, Esq., Nos. 2a and 5a—oil painting in frame.
Lord de Ros, for No. 1—a silver goblet.
Col. Locke, Nos. 37 and 47—large album elegantly bound in morocco.
W. S. Hobson, Esq., for Nos. 116 and 120—a silver goblet.
Dr. Brown, for Nos. 16 and 17—a silver goblet.
J. C. Stenning, Esq., Nos. 10, 12, and 13—oil painting in frame.
R. O. Milne, Esq., for Nos. 23 and 29—an oil painting in frame.
Col. J. K. Turnbull, for No. 15—a large album elegantly bound in morocco.

Capt. G. F. Smith, for Nos. 103 and 105—an oil painting in gilt frame.
J. McAndrew, Esq., for No. 38—an album elegantly bound in morocco.

R. Murray, Esq., Dry Plate Prize for No. 93—an oil painting in gilt frame.

Certificates of Honorable Mention were awarded to G. W. Brewis, Esq., K. D. P. Roberts, Esq., and the Hon. Noel Waldegrave.

The Earl of Rosse proposed a vote of thanks to Mr. Glaisher for the time he had spent in classifying the pictures and for his able report. This was seconded by Dr. Arthur Farre, and carried unanimously.
A. J. MELHUISE, Hon. Sec.

Talk in the Studio.

MR. MOODY'S PHOTOGRAPHS.—It would appear from the following communications to the *Times* that it is difficult to prevent the circulation of unauthorized portraits or alleged portraits, however much the original may object to the publication of his portraits at all. Mr. Moody objects to publish his photograph, but it is circulated by the thousands in spite of him or his wishes. Some comments in the *Times* gave rise to the following in its columns:—"Mr C. B. Cooper writes to us from Edgbaston, Birmingham:—'Will you permit me to correct two statements in your otherwise excellent article on the American Revivalists? The article says:—'Nor do we reprobate less the scattering about broadcast of the photographs of the Revivalists. It is hard to know on what grounds a man like Mr. Moody can allow this to pass without stern reproof;' and, again, 'to be fêted and caressed is to face a greater danger than that of being told to give up all attempts to make a speech. Mr. Moody has overcome the second—the lesser—danger, but when we look at his photographs in the shop windows and hear of his confident assertions we are not at all sure that he likely to escape the first—the greater.' As one of the committee during the visit of the Revivalists to Birmingham, I am in a position to say that it is very much against the wish of Mr. Moody that these so-called photographs are exhibited and sold. I can state as a fact that during the visit of Mr. Moody to this town the large sum of £1,000 was offered him to sit for his photograph, which offer he unhesitatingly declined, and he told me that he would give £500 to be able to prevent the portraits being sold, but, as the persons who sell them were altogether beyond his control, he could not do so. In conclusion, I may say that the portraits sold in this town (and, I presume, also in London) are not photographs from the person, but from a sketch taken without the knowledge or consent of Mr. Moody.' Mr. Thomas Stone, chairman of Messrs. Moody and Sankey's Committee, writes to us from Moorgate Street Hall:—'Your article of Friday, reviewing the mission so recently closed by the American Evangelists in London, deplores the scattering about broadcast of Mr. Moody's photographs. Allow me in reply to assure your readers that during Mr. Moody's visit to this country he has steadily refused to sit for his photograph, though frequently tempted to do so by large monetary offers, and that eight years have elapsed since he consented to have his photograph taken, which was then done only for family uses. Mr. Moody deeply laments the unauthorized circulation of his photographs, many of which are rather caricatures than likenesses, and he is still more pained by the publication of books giving accounts of his life and work, which are every one of them issued without his consent, and contrary to his wishes.'"

To Correspondents.

SIGMA.—Your questions must be addressed to M. Lambert, the patentee; we have no knowledge of his business arrangements.

The letters and statements to which you refer as in our last issue are really in the advertisement, which, by an error on the part of our printer, which gives us serious displeasure, much too closely resembles the literary pages of the PHOTOGRAPHIC NEWS.

H. BROWNIGG.—We have no certain knowledge as to whether Miss Thompson's picture in the present Academy Exhibition has been photographed or not, but it is tolerably certain that photographs have not been published.

H. W.—As a rule a lens is sent out by the optician to do its best best precisely as it is. You cannot shorten its focus without adding another lens, and this would probably introduce a number of errors and drawbacks which would outweigh any advantage.

L. S. C.—The tendency to orange-coloured fog on the shadows whilst intensifying is one of the troubles often encountered during warm weather. Many causes will tend to bring about the trouble; but there is one tolerably certain remedy, or preventive, equally useful whether intensification takes place before or after fixing. Make a solution as follows:—Iodine 1 grain, iodide of potassium 2 grains, water 1 ounce. After developing with iron wash the plate; then apply this solution, allowing it to flow over the plate for about a minute. Wash off and proceed to intensify. This will generally prevent all risk of the stains in question. The developer you use might in many circumstances give intense negatives enough without further intensification; but intensity depends on other matters besides the developer, especially on the quality of the collodion and character of the light.

A. B. H.—Various methods may be employed; but we have generally found that no difficulty was experienced in securing perfect contact between the sensitive paper and paper negative if we placed the paper negative on the glass, then sensitive paper, next a few sheets of smooth paper in contact with the sensitive paper, and then a piece of soft felt or blanket.

R. A.—If you read the various numbers of the PHOTOGRAPHIC NEWS for the last two months you will find that the influence of nitrate of uranium in the negative bath has been the subject of much discussion, and that much yet remains to be learned on the subject. See also letter and article in the present issue. 2. The only office of acetic acid in the developer is that of a restrainer, preventing the reducing action of the iron salt from being too energetic. If too little be added, there is risk of fog; if too much, development is slow, and there is risk of producing a result analogous to under-exposure. As a rule the use of a strong solution of iron permits a reduction of exposure. The tendency of a strong solution is to bring out the image rapidly, and to give a detailed image without much contrast, whilst a weak solution develops slowly, and tends to produce contrast. Other things being equal, a strong solution needs less acetic acid in proportion than a weak one, because it does not require keeping so long on the plate, and hence requires less of a restrainer to check any tendency to fog. A weak iron solution often requires to be kept on the plate a long time to bring out the image, and unless sufficient acetic acid is present there is risk of fog. You will thus see that twenty minims of acetic acid may be sufficient to check any tendency to fog when using a fifty-grain iron solution which does its work rapidly, and may not be too much with a ten-grain iron solution which does its work slowly. We have written many articles on the subject of developers and developing in the NEWS; but the subject is not treated especially in any book that we know of.

S. P. Q. R.—That you indicate by No. 9 will best answer your specific purpose, and also general purposes. The small air-bubbles in the back lens of your portrait combinations will not interfere with its working or rapidity in any appreciable degree. The circle of light you describe is really an image of the stop; the lens was doubtless pointed somewhat towards the sky. Shading the lens would probably have removed it. The remarks to which you refer had no reference to your communication. The remarks in question would really have been better omitted altogether, but they escaped our immediate attention at the time.

CARTZ.—We cannot with certainty judge of the quality of the lens from the example sent. The definition is not good; but this defect, whilst it generally indicates an inferior lens, may not necessarily be caused by the fault of the lens. The want of contrasts of detail are not due to the lens, but to imperfect lighting of the figure, which has apparently been taken in the open air, or, at any rate, in an even diffused light, illuminating all parts of the face equally. To obtain due effect of relief and pictorial light and shade, the direct light should come from one source only, best somewhat to one side, and a little in front; this would light one portion of the face vividly, leaving the remainder in half shadow, giving roundness and relief.

E. T. R.—If your lens fail to give satisfactory definition, it is doubtless one of inferior quality; but, as a rule, an imperfect lens fails to define anything well, whether in light or shadow. If you send us an example of its best work, we can better advise you. Of those you mention, B is probably the best and most useful.

W. W.—There is no precise and unvarying formula for the use of nitrate of baryta in the silver bath; from five to ten grains of the baryta salt to each ounce of solution will serve. It is added at any time, either when preparing the solution, or at any subsequent time.

CHARLES KNIGHT.—Much of your letter is libellous. You are quite at liberty, if you disapprove of an article, or think its price too high, to decline to purchase; but you have no right on conjectural grounds to publicly depreciate it or try to prevent others purchasing.

ERRATA.—Two obvious misprints occur in Mr. Werge's letter in our last. In the second paragraph the word "stamp" should have been "stump," and in the third paragraph the word "light" should have been "tight."

RELANDER FUND.—Received from Henry Gregson, 10s.
Several Correspondents in our next.

The Photographic News, July 30, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE COMPOSITION OF THE PHOTOGRAPHIC IMAGE—PHOTOGRAPHS AND RIFLE SHOOTING—A SLICE OF LUCK.

The Composition of the Photographic Image.—The composition of the photographic image is a subject that seems likely to be thoroughly discussed once more, for a German chemist, one Freiherr von Bibra, has recently occupied himself with the analysis of blackened chloride of silver, and obtained results which prove, according to him, that the image is not really the sub-chloride. Most photographic chemists, it will be remembered, are of the opinion that in the formation of the photographic image the chloride is changed into sub-chloride by parting with a portion of its chlorine, and the formula Ag_2Cl_2 is usually given as the composition of this sub-chloride. Von Bibra has analysed, according to the Journal of the Berlin Chemical Society, as many as fifteen specimens of chloride of silver blackened by light, and the concordant results of these experiments proves the composition to be Ag_2Cl_2 . He promises further details of his work in a subsequent paper, and merely remarks at present that his chloride was prepared by adding hydrochloric acid to the basic citrate of silver. It would be well if he would state whether he has gone so far as to examine any actual photographic images, and also whether he has confined himself to an investigation of the chlorides of silver, or whether he has examined the iodides and bromides of the metal also. Any carefully conducted investigation of this nature would be of singular interest to photographers.

Photographs and Rifle Shooting.—One of the requisites to make a good soldier, as every volunteer knows, is to be able to "judge distance" correctly. The rifles, sighted to a thousand and twelve hundred yards, such as our troops are armed with, lose much of their value when wrongly adjusted, and the best shot in the world might fail to hit a mark at a thousand yards if his rifle happened to be sighted for five hundred. Shots at Wimbledon could tell you how often they have sent bullets wide of the targets from a mal-adjustment of the sight, having forgotten to alter the foresight of their rifle when they moved from one range to another. But at Wimbledon, where all the ranges are known and marked, defective shooting can only arise from this cause out of sheer forgetfulness. It is different, however, in the case of troops skirmishing, or formed in line of battle. Then it becomes necessary to use one's judgment as to the distance of the enemy, in order to render the fire as effective as possible, and one must needs bring every bit of experience to bear in the matter. All recruits are subjected to a course of instruction in "judging distance" before they proceed to musketry instruction, and we cannot help thinking that the camera might be of considerable assistance in here aiding the education of a soldier. What a man has to learn is the comparative size and appearance of men and horses at various distances, from fifty to a thousand yards, and a camera picture of infantry, cavalry, and artillery at various distances would, we think, afford valuable aid in the matter. A long-focus lens should be used to render the images as large as possible, and although to the eye the size of the men and horses might appear different, there is no doubt that the plate would yield an instructive picture as showing comparative distinctness and size at the different ranges. Trees and shrubs would be shown in the same proportion as the troops, and thus a good idea would be conveyed to the mind of a recruit of the distance of an enemy at any time.

Riflemen and skirmishers would no doubt value a range-picture of this kind, but with artillery, which cannot be concealed very well, the matter is different; artillerymen, as a rule, believe in firing a few telling shells to begin with, which they hold to be the best range-finders in the world.

A Slice of Luck.—Of all itinerants and pedlars who frequent fairs and races, there are few who earn their money so hardly as the travelling photographer. His undertakings, for the most part, are very speculative, for it is seldom he has a chance of getting his fee until the work is done, and then the money is frequently not forthcoming if the plate turns out badly, or the customer happens to be hard to please. It is very seldom, however, that a photograph miscarries with him; and when it is borne in mind the vicissitudes attending the wet process, and the fickle disposition of the groups and sitters to be dealt with, it may be said that such portraitists fairly earn their scant income. To the itinerant photographer an endless roll of sensitive negative paper, such as M. Warnerke promises us, will be a boon, and there ought, indeed, to be a good market for such a commodity among every class. It is not always that the itinerant photographer comes off so badly as one might imagine, however, for we were witness lately of a very good stroke of business. On the occasion of a popular cricket match the other day, an itinerant photographer managed to get a little positive picture of a party on a drag while at lunch—just such a scene, indeed, as one may see at the Derby, or at other popular gatherings. Having mounted the little photograph neatly in a *passaport*, he brought it back to the company as they were drinking one another's healths in champagne, and offered it for sale. Being successfully taken, the ladies of the party with their pretty out-door costumes contributing much to form a picturesque scene, there was at once a great inclination to purchase on the part of several of the company, the demand being met by the wily photographer with no very great eagerness to part with the print. The picture was such as he would gladly have taken a shilling for under ordinary circumstances, but as matters now stood he was naturally anxious to get as good a price as he could. So the little photograph was put up to auction then and there, and before many minutes had passed the exciting competition had brought the lucky photographer twenty-four shillings for his ten minutes' work. We fear that very few make such capital speculations as the one here recorded, and one is heartily glad to see "a slice of luck" fall into good hands now and then.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XI.

THE GLASS HOUSE.

HAVING studied the dark room work, we will step forth into the skylight and study the manipulations which have hitherto been merely alluded to—lighting, posing, exposure of the plate, &c.

Our attention is first directed to the dimensions and build of the glazed roof and side through which the light passes to illuminate our sitters. The build of the skylight is of very great importance, but we are often compelled by circumstances to some modification of our plans by the space at our command and the plan of the house on which we propose to build our skylight. Again, many have to take the skylight as they find it, with all its defects and imperfections; but here, if a ready ingenuity is brought to bear on the subject, is scope for management that will tend to make even a bad light a passable one, by a judicious arrangement of screens and reflectors.

As it is quite impossible to explain all the plans on which skylights have been built, point out their faults, and suggest remedial alterations and modifications, I shall confine myself to a description of the best and handiest form of skylight.

Our object is to produce light and shade, and the skylight which most readily produces this with all the beautiful gradations between high light and the deepest shadow, is our aim to secure. If the light is projected on the sitter from one point, the contrasts are too severe, and gradation

is entirely lost, while two lights of equal strength from opposite directions would destroy all contrast, and produce a flat and unnatural effect. The light we require must be soft and diffused.

The direct rays of the sun must, it is obvious, be avoided, so that our first care is to secure an aspect on which the sun's rays linger least. On a skylight of eastern aspect the sun shines in the morning, and a western light receives the afternoon rays, while into the skylight of southerly aspect the sun streams both before and after noon; the north alone is free from this objection, hence that aspect is obviously the one to be selected for our skylight.

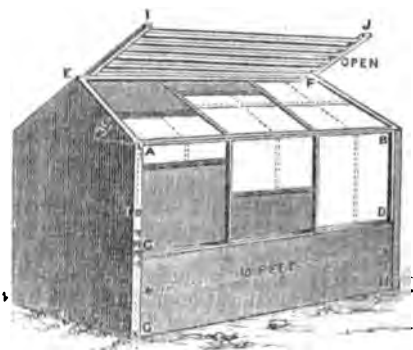
It is to be borne in mind that one skylight will not suit all classes of work equally well, for, whilst a low light, speaking generally, is better adapted to the illumination of standing figures, giving brilliancy to all parts of the picture, a light of higher build is more adapted to the head and bust style of portraiture, so that it is essential so to construct the light as to adapt it for the production of general work.

The side and top light combined is the favourite form of skylight, though I am of opinion that for portraiture a *sloping side light* presents more advantages, with fewer disadvantages, especially where the practice is confined to head and bust portraiture.

The gallery should not be less than ten feet long, which will represent the length of the sidelight (more than that is unnecessary), and the height (say) twelve feet. With this altitude a side light sloping inwards from a point three feet from one to another, four feet in the roof, will give ample top light for most purposes of photographic portraiture. The three feet below the light should be boarded up. Movable spring curtains, that admit of shading portions of the light, either top or bottom, render this light particularly manageable for all styles of illumination of the head and bust.

For the combination top and side light, let the side window of the length given above—ten feet—rise to a height of eight feet of the floor, giving five feet in height of glass (the lower three feet being boarded up, as described above); from the top of the side light the top light rises at an angle of thirty-five degrees to the ceiling, the rest of which is covered in.

The cut here given will explain the arrangement of the lights:—



A, B, C, D, represent the dimensions of the side light, five feet high by ten feet in length; A, B, G, H, being the entire side of the structure, including the three feet boarded up below the light. E, F, A, B, is the top light, having a "pitch" of thirty-five degrees. This is designed to permit of the rain readily running off. At certain seasons of the year, when the sun attains a high elevation, its rays may intrude through the top light, and to prevent this to a certain extent, the poles E, I, and F, J, are built, on which are fitted movable seats resembling Venetian blinds, under control from within the skylight. As a substitute, a canvas may be fitted with rings running on the poles, which canvas may be hoisted or let down at pleasure from within by means of ropes. This canvas has several disadvantages,

not the least being that, like a sail, it may be carried away in a high wind, leaving you under "bare poles," or carry away the support with it.

To guard against leakage—for the most carefully built skylight will leak—the sashes of the top light should be fitted inside with narrow gutters from the ridge of the top light into a common gutter running along the top of the side light. A little outlay in this will save you much in carpets, furniture, and instruments.

The glass of the lights should be of good quality, perfectly white, as on that the purity and strength of illumination depends; and the panes should be as large as practicable, that you may not lose light by a multiplication of sashes; and to have as few lappings as possible, these lappings should be about one-sixth or one-fourth of an inch.

Ventilation should be provided for: one or two sashes in the side light may be fitted to open, either on a pivot or on hinges.

Now we have the light, our next care is to be able to cut it off at pleasure. It will be found in portrait photography that the varying types of countenance to be treated by the portraitist demands different illumination as well as arrangement of pose; and to be able to carry out the plan formed in the mind for the illumination of a particular face, we must have the light thoroughly under control.

Some men there are, unfortunately for photography, who have no idea of the effect of light and shade, to whom the best arrangements of blinds are merely obstructive; but to the artist they are as necessary as brushes and colour to his brother of the brush.

The methods of securing and cutting off the light are very various, almost every individual worker having some plan of his own, either from choice or the necessity forced upon him by the peculiarities in the build of his skylight. I think the very best plan I have known is to provide three shades on spring rollers, whose combined width covers the entire area of the top light. The rollers are fitted to the top ridge of the light (inside, of course), with a little wheel over which the string runs fixed at the *top of the side light*, governing it. These runners are fitted with a self-acting catch, doing away with the necessity of tying the string communicating with the blind to keep it in place. The blinds of the top light are fitted so as to pull down; those of the side light should pull up, the roller of the blind being fixed to the bottom of the side light, and the string running over the little wheel at the top; so that when both shades are in use *the light is not divided*. Too often we see this blunder which a very little consideration would have avoided.

The floor of the skylight should be very even and steady, and, to present a pleasant appearance to the eye, should be covered in some way either with oilcloth, carpet, or matting, unless an inlaid floor is put down. At first sight this appears to be a very expensive proceeding, but, as being very durable, and the very best thing you can have, it is not so in the long run, as it wears many years, and outlasts carpets and oilcloths, and always looks well. Oilcloth is, perhaps, the next best thing, with a carpet for the portion of the gallery on which the sitter is posed. This is a necessity where full-length portraits are made.

Pictures pleasantly adorn the walls of the skylight, and aid very much to do away with that painful, hopeless feeling sitters appear to experience in our ateliers. A little adornment and brightening would tend to do away with the necessity for our repeated injunction to the sitter to "try and look a little more cheerful."

THE PRACTICAL PRINTER IN AMERICA.

XXXII.

GENERAL PLAIN PAPER PRINTING.

Plain paper prints are generally made so that, by the aid of the finisher, fine results can be obtained from

poor negatives. We seldom make, for the above reason, plain paper prints from life negatives, but from copy negatives—i.e., negatives taken of other pictures, either from the poor ferrotype or the excellent Daguerreotype, and which, when enlarged from the size of the picture to be copied, all of the roughness and defects on the picture are also enlarged in the same proportion as the portrait itself is; hence, these defects are very ruinous to the fineness of the finished prints, rendering them, in many cases, totally unfit for any kind of printing that cannot be worked up; and although considerable work on albumen paper, in the way of colouring with water-colours, is done, yet by far the greater proportion of the work is done on plain paper, and worked up in India-ink.

It is, however, indispensable with a good copyist to take measures to prevent as far as possible these defects from showing, and the rolling of the prints, the cleansing of them with encaustic paste containing Marseilles soap, placing the print (a photograph in this case) when wet between two pieces of glass and copying it immediately before it dries, and a number of other ways, are adapted to bring about the same result. Sometimes, however, life negatives are printed on plain paper, and worked up. When done nicely the result is splendid, as there are no such defects to contend with as there are in a copy negative.

I give the following formulae, &c., for a ready reference for the beginner. Plain unsalted paper is purchased, and the fine side is floated on for ten seconds, or the whole sheet is drawn through the following

Salting Solution.

Pure rain-water...	...	60 ounces
Chloride of ammonium	...	360 grains
Gelatine ...	...	120 "

The Positive Bath for Plain Paper is either a plain bath of thirty to forty grains strong of nitrate of silver to the ounce of pure water, the albumen paper bath (which had better not be used), or another bath known by the name of "ammonio-nitrate bath."

Silvering Plain Paper.—This is done either by placing the sheet on a solution called the printing bath, or by swabbing. If floating is preferred, then twenty-five to thirty seconds on a bath of thirty grains strong is about right for summer, and thirty-five to forty seconds on a bath of forty-five grains strong is best for winter. In swabbing the paper, pour on to the fine side of it about half an ounce of the solution, and distribute it equally over the surface by means of the swab.

"Doctoring" the Negatives before Printing.—Look out for heavy shadows, heavy lines, and also look to see if you can improve the look of the forehead, cheeks, nose, chin, ears, hand and arms, flat faces, &c., &c. The remedy is generally—i.e., to myself—either the blue paint dodge, Irish process, or the retouching pencil. Make it your business to study every negative that falls into your hands for you to print from.

FURTHER TREATMENT OF THE PRINTS AFTER PRINTING.

The plain paper prints when printed are then to go through the same operations as the albumen prints. In the first place, the edges of the prints are trimmed, so that they will not be so likely to tear in the water.

After the albumen prints are toned, the plain prints are washed by hand—which can be accomplished in three minutes—and then toned immediately. The strength and look of the plain paper prints are hurt considerably if they are permitted to pass through the same treatment for so long a time as the albumen prints are, and for this reason they should never be placed in the acidulated water unless the quantity of the acid in it is very small, as it flattens the prints fearfully.

The prints should not be "washed to death" before they are toned, which they would be if they were to be subjected to the same time of washing as the albumen photographs

are. The horny surface of the albumen prints is different from the soft and spongy surface of the plain, and whereas it may take fifteen minutes for the washing and acidifying solution to do its work on the hard surface of the albumen paper, three minutes would be ample time for the plain paper.

In the first water for the plain paper prints, about a dozen drops (no more) of acetic acid No. 8 may be placed, but after the prints have been in there two minutes, remove, and rinse them well from the acid water, and then they are ready to be toned.

The prints are toned slowly, so that the action of the gold on them will not be so rapid as to cause them to show weakness, which they will surely do if the toning is rapid and forced. To do this, they are generally toned after the bath has toned the albumen prints, and is well-nigh exhausted.

The albumen paper toning-bath can be used for the plain prints, whether made up every night fresh, or not, without any hurt to either the bath or the prints. They should also be toned face up in the bath, as stronger prints are obtained by so doing than if they were toned with the face down in the solution.

When the prints are toned blue, rinse the toning solution from them, and then they are ready to be fixed in the ordinary fixing-bath. Fix ten minutes, keeping the prints in constant motion during that time, and then weaken the bath three times, thus making it finally like unto the density of water. The albumen and plain paper prints can be all fixed in the same bath.

The washing of the plain prints can be done in a much shorter time than the albumen ones; and if the printer can, he had better remove them from the bath of fresh water when they have been washed thoroughly—say four or five hours in continually changing water will be plenty of time. The prints are then mounted on good card board, and when dry they are rolled once under an ordinary roller, and under slight pressure. Never think of using the burnisher for plain paper prints. The prints are now ready for the India-ink artist.

ON PHOTOGRAPHIC IRRADIATION.

BY CAPTAIN ABNEY, R.E., F.R.A.S., F.C.S.*

If light be scattered from particles, it must also take place in a direction parallel to the surface of the film—that is, in the film itself. Since the thickness of the film

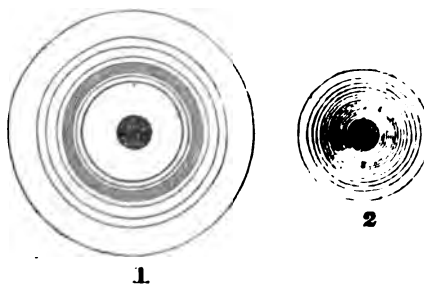


Fig. 3.

is so small, we need only consider the amount that would fall on a plane at right angles to the surface. With the same hypotheses as before, and treating it similarly, and taking B as the origin of x along BC and $OB=h$, we have

$$x = r \sin \theta + (h - r \cos \theta) \cot 2\theta.$$

If we make h large compared with r ,

$$x = h \cot 2\theta;$$

as before we obtain

$$I = \frac{I_0 r^2 h}{4} \frac{1}{(h^2 + x^2)^{\frac{3}{2}}},$$

* Continued from page 357.

and the same curve obtains as in the last case, showing that the greatest intensity of light is in the direction parallel to the surface of the film.

When λ is not large compared with r , the same result holds, though the plane of maximum reflection will not pass through the centre of the particle. The light reflected horizontally would obey the ordinary laws of absorption, and the intensity be represented by

$$I' = Ie^{-\mu z},$$

where z is the distance along the film measured from the point of incidence.

If the relative effect on the sensitive film could be represented by T , where T is the length of exposure, then it would be easy to calculate exactly the distance to which the irradiation from this cause would extend. Experiment has shown that this simple relation does not hold good, the practical results having been given in the above quoted paper. There it will be seen that the shorter the exposure the less proportional irradiation there must be. If, however, we take this relation to hold good, the effects of irradiation in any example we may work will be in excess of the truth. In the experiment (i) it was found that the limit of irradiation by reflection with $\frac{1}{4}$ second's exposure was caused by an intensity of sunlight = .0016, together with that caused by the light from the sky. The sky-light would also equally act on that part of the film which would be affected by the light scattered parallel to the plate. The thickness of the film was .004 inch; hence $\mu = 750$ nearly for each inch.

From other experiments taking images on opaque surfaces, it was found that, with similar exposures and under similar conditions, the extent of developable irradiation was nearly .005.

By taking the mean intensity of the light passing through the film, we can find approximately the proportion of light which is scattered parallel to surfaces to that reflected from the plate. Let m be ratio,

$$\begin{aligned} .0016 &= .8e^{-750 \times .005} \times m; \\ m &= .28. \end{aligned}$$

If the sun's image were photographed (say) 4 inches in diameter with an effective aperture of 2 inches, instead of .05 and $1\frac{1}{4}$ inch respectively, it would be seen, calculating from the above data, that with an exposure of $\frac{1}{16}$ " (supposing the simple relation between I and T held good) no developable image could be formed, much less could there be irradiation due to either cause. Now it is well known that with the photo-heliograph under these conditions a good image of a clear sun is obtainable. Evidently, then, the connexion between I and T is of a more complicated nature.

It will be noticed that a large difference in two intensities of light (giving the same exposure on the same film) will make but a small difference in the extent of irradiation, as the co-efficient of absorption is so large. In the case of the late transit of Venus this has an important bearing, as the actinic intensity of the sun diminishes from the centre to the limb, the highest estimate given for it being from about 1 to $\frac{1}{16}$. The increase in diameter of the sun and decrease in that of Venus will be measurably the same.

To diminish irradiation due to the first cause pointed out, three methods are open:—First, to coat the back of the plate with some non-actinic colour; secondly, to increase the opacity of the film; thirdly, to connect the particles of bromo-iodide of silver with a body of as nearly as possible the same density. The first is the usual method adopted by photographers in dry-plate processes. This diminishes the irradiation from the back of the plate, but does not completely eliminate it, as will be understood when the nature of the resulting reflection is considered. The second method is easily carried out, and is more effective than the first method. The last is a plan adopted in certain dry-plate processes. With albumen preservative particularly, the amount of irradiation is reduced materially, even though the film appears nearly transparent. One

other method may be noticed, viz., staining the collodion itself with an adiactinic colour. This does not seem to commend itself, as the sensitiveness of the plate must be reduced in proportion to its efficacy.

To diminish irradiation due to the second cause, Nos. 1, 2, and 3 methods are effective.

Since writing this paper I find that my friend Mr. Cowper Ranyard has noticed, though I believe has not published, the fact that irradiation is most marked at a distance corresponding to the critical angle of reflection in glass.

MORE ABOUT EMULSIONS.

BY H. J. NEWTON.*

IN my former paper I promised to communicate to you the results of further experiments with the bromide emulsion. Before speaking, however, to the main point, I would like to call your attention for a few moments to the substratum or preparatory coating of the plates, as it is an important element in the successful working of dry plates. It has been found that albumen prepared in the ordinary way would not answer the purpose, as the alkali employed in the development would soften the albumen sufficiently to loosen the film from the glass. I found that albumen dissolved in water with ammonia was much more readily dissolved, after having been dried, than a plain solution of albumen.

After trying several things to preserve the albumen, I adopted carbolic acid in the following proportions:—In eight ounces of water dissolve the albumen from one egg (if dry albumen is used, take ninety grains); then into another vessel containing eight ounces of water put sixteen drops of carbolic acid.

After the albumen is thoroughly dissolved, add the eight ounces containing the carbolic acid. Plates prepared with a substratum of this albumen effectually resist the action of the alkali developer. I have not had the first indication of a blister in all the plates I have made with this substratum.

The formula which I have adopted is twelve grains of bromide of cadmium in collodion made as I gave it in my former paper, to which eighteen grains of nitrate of silver are added. Eight or ten hours after add three grains of chloride of cobalt. The chloride can be added dry, if finely pulverized, and the emulsion frequently shaken during the first few hours afterwards.

Since we last met I have been trying bromide of magnesium, expecting, if I succeeded, to obtain a film which would flow more evenly than that salted with a cadmium bromide, especially when new. The first ten days of my trial with the magnesium salt rewarded me with nothing but disappointment and fog. The first lot I made, however, which is now over two weeks old, begins to show very promising results, and I anticipate being able, in a few days, to produce superior negatives with this emulsion.

In my former paper I expressed doubt in being able to compound a preservative which would work more satisfactorily than the one I then gave you; but there was the fact, which I stated, that it was decidedly acid, and I purposed to try the squills without the syrup. Some of them I soaked in cold water twenty-four hours, and some I steeped in hot water two or three hours, adding one ounce of alcohol to every six ounces of the solution. This made a preservative which gave more sensitive plates than my former preservative. The bitter quality of the squilla, however, suggested nux vomica, the bitterness of the two being the same, so far as the taste could determine. I therefore was induced to try the nux vomica, and compounded a preservative as follows:—

Water	16 ounces
Tincture of nux vomica ...	5 drachms
Landanum	8 "
Alcohol	2 ounces.

* Read before the Photographic Section of the American Institute.

This preservative is simple, easily prepared, and will keep. I have adopted it, and shall adhere to it until I find something better.

I am of opinion that ten or fifteen grains to the ounce of gum-arabic will increase the sensitiveness, and shall give it a trial. Some object to gum arabic in the preservative, on account of the tendency of the film to blister in the development. I do not think that this will occur with plates prepared with the substratum as I have given it. If trouble should arise from this cause, the development can be accomplished without the alkali quite as satisfactorily, without additional exposure. Proceed in this way:—Make a solution of pyrogallic acid and water, anywhere from six to twelve grains to the ounce. After the plate has been washed, flow it with this pyro solution until the image appears and the detail is all out; then pour the pyro back into the bottle, as it can be used for any number of plates, its developing power not being exhausted by repeated using. Then flow the plate with a solution of tannin and pyrogallic acid, six grains each to the ounce of water; after flowing off and on a few times, or until the action has become even over the plate, pour it off into a bottle containing eight or ten drops of a plain silver solution in water, twenty grains to the ounce (this is for a 5 by 8 plate), and again flow the plate. The intensity will immediately begin, and go on until the silver is exhausted. If sufficient density has not been attained, wash the plate and repeat the operation, using, however, one-half the strength of the developing solution and silver. You will not find it necessary to repeat the operation more than twice. I am of opinion that more satisfactory negatives can be obtained in this way than by using an alkali. If after fixing they should be found too weak, they can be readily strengthened by proceeding as follows:—Make a strong solution of iodine in water with iodide of ammonium, and to three ounces of this solution add half an ounce of muriatic acid. Add enough of this stock solution to an ounce of water to give it a good orange colour, and flow the plate with it a few times, and wash off. If the plate has become dry, wet it before flowing with the acid iodide solution; after thoroughly washing, flow it with the pyro and tannin solution, using half strength; pour off as before into a vial containing a few drops of the silver solution, and proceed as when developing in the first instance. A little acetic acid should be added to the pyro and tannin solution.

The film which this emulsion gives is very dense, making it thereby unnecessary to use any backing for the plates. If, however, anyone should be using plates which require backing, there is a very simple way of doing it. It is as follows:—Take two ounces of syrup or molasses, and add four ounces of water; pour this into a dish, and lay into it some sheets of black paper, or any other coloured paper which is opaque; lay them down with a glass rod or triangle; cut them a little smaller than the plate. After the number required is in, place your finger on one corner of them, and pour the syrup solution back into the bottle for future use. Let them drain well, and take the dish containing them into the dark room; and, when your plate is in the holder, lay one of the sheets of paper on the back of it, rub out the air-bubbles, and the backing is complete. There is just adhesive power enough in the paper to make the contact with the glass complete, and to retain it in its position. When the exposure has been made, the paper is readily removed, and can be used in the same way again.

Since writing the above I have succeeded in developing plates prepared with this emulsion with iron and silver, details of which development I will explain at some future time.

SALICYLIC ACID.

SALICYLIC acid, thanks to the researches of some German savants, has recently sprung into considerable note, and as it promises ere long to become more widely known—in fact, to become an article of everyday use—we reproduce the following particulars from the *Industrie Blätter*, to which

magazine they were furnished by a company of manufacturing chemists in Berlin. Salicyl C_7H^4O is found in the volatile oil of *Spiræ ulmaria* (Meadow-sweet), and also in the oil of the partridge berry (*Gaultheria procumbens*). From these it is obtained in the form of salicylic acid, which is converted by treatment with hydrate of potash and hydrochloric acid into salicylic acid. This is a pale yellowish powder formed of small crystals or fine needle-shaped particles. It precipitates in cold water, dissolves readily in hot water, alcohol, or ether, and fuses at $159^{\circ}C$. Under a slow heat it will sublime without decomposition. Heated quickly, it resolves into carbolic acid and carbonic acid. The researches of Professors Kolbe, Knop, Neugebauer, Thiersch, and others prove that salicylic acid is a perfectly efficacious substitute for carbolic acid, over which it possesses two advantages—a sweetish taste, and the absence of disagreeable smell. It is excellently adapted for preserving eggs, fresh meat, jams, beverages, medicinal essences, drugs, dye extracts, &c. Professor Neugebauer's experiments show that 100 grammes of salicylic acid sufficed to prevent fermentation in 1,000 litres of must. He recommends its use in wine-making, and in the treatment of the various affections of fermentative origin to which wines are subject.

According to Professor Kolbe, 5 grammes of salicylic acid effectively arrested the fermentation produced by the mixture of 5 grammes of barm with 120 grammes of sugar in a litre of water. He recommends its use in the manufacture of effervescing wines, export beers, &c. Fresh water on ship-board may be kept sweet by a mixture of the acid in a proportion not exceeding 1 part of acid in 20,000 of water. Or the water may be filtered, as required for use, through cotton-wool dipped in a solution of the acid. Meat may be kept fresh for weeks by rubbing it over with the acid, the latter being washed off when the meat is required for use. New milk containing .04 per cent. of the acid, when left uncovered for thirty-six hours, was found in better condition than an equal quantity of the same milk without any admixture which stood beside it. The professor's researches show that this antiseptic action is due to the free, not to the acid, neutral salts.

Salicylic acid may be used as tooth-powder, or, mixed with warm water, as a mouth-wash. Sprinkled over the feet, it is an effectual remedy for offensive odours arising from the perspiration. Applied as a powder with talc, soap, and starch, it renders the feet white and firm, and is a good antidote to sore feet, well adapted for the use of travellers and soldiers on the march. Mixed with powdered starch it may be advantageously applied to sores and cutaneous eruptions. A mixture of 1 part of salicylic acid, 3 parts phosphate of soda, and 50 of water forms a good wash for promoting the granulation of wounds. In operations involving much loss of blood, Professor Thiersch employs a solution of 1 part of the acid in 300 of water, to sprinkle the injured surfaces and to steep the bandages.

Dr. Fehling states that at Leipsic, salicylic acid is now universally employed as a substitute for carbolic acid in obstetric practice. In disinfecting the hands, clothes, &c., in cases of puerperal disorders, it is used either mixed with water in the proportions 1 to 300 or 1 to 900, or as a powder mixed with amyl in the proportion 1 to 5.

Salicylic acid is soluble also in fatty oils, and may therefore replace carbolic acid in the preparation of Lister's bandages. Its internal uses in cases of diphtheria, scarlatina, measles, small-pox, syphilis, cholera, &c., has yet to form the subject of experiment. Professor Kolbe finds that daily doses of 1.0 to 1.25 grammes of salicylic acid may be taken without affecting the digestive functions or the general health. The internal use of salicylic acid in a crude state is not to be recommended, on account of its irritating effect on the mouth and throat; but Professor Wunderlich administers it in an emulsion composed as under: 1 gramme salicylic acid, 20 grammes ol. amygd. dulc., 10 grammes gummi arab.; mix, and add 2 grammes syrup amygd. with 45 grammes aq. flor. aurantii.—*English Mechanic*

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CERTIFICATES FOR OPERATORS.

A DESIRE seems to exist amongst photographers, which is constantly finding reiterated expression, for some form of certificate of culture or diploma of merit by which distinction should be conferred or capacity guaranteed. From time to time proposals arise to establish a school, or college, or institute, in which photographers might, after graduating, pass examinations and acquire degrees or certificates indicating the degree of proficiency and skill they have attained. Once or twice it has been proposed that the Photographic Society should undertake the function of granting such diplomas. Indeed we have on occasion seen ambitious aspirants for honours describe themselves as members of the Photographic Society as implying professional distinction. A letter in our present issue dwelling on the necessity which, in the writer's estimation, exists for some trustworthy means of distinguishing between competent and incompetent operators, or between degrees of competency which exist, proposes a very simple arrangement for meeting that necessity. He suggests that a board of three trustworthy gentlemen accomplished in the art should undertake the duty of examining photographers, and giving them certificates according to the degree of proficiency shown during this examination, the remuneration of the members of the examining board to be derived from the fees of the candidates for honours.

That any system which might furnish trustworthy certificates of ability would be of service to employers and employed alike, we cannot doubt. It is true that, so far as we are aware, no precedent for such a system is found in other art industries; but photography is an art or science *sui generis*, demanding a range of culture and accomplishment probably not required in any other skilled industry. And whilst, for occupying a responsible position in a high-class studio, the operator requires this comprehensive culture, time alone will demonstrate to an employer whether it is possessed by the operator or not, and the probation at times is a hazardous one. The existence of absolutely trustworthy certificates would unquestionably be a boon on both sides. But we must confess that at present we do not see any probable mode in which certificates possessing any value can be acquired. A little reflection will show our correspondent that his plan is hopeless. The first question which arises in connection with his project is, how, or by whom, is the examining board to be appointed? To possess any absolute value, the certificates must come from an unchallengeable authority; and by what process can a board be secured possessing any authority whatever? If a board could be established by the universal suffrage of the photographic community, it would possess authority; but where is the machinery of obtaining such suffrage? A body like the

Photographic Society of London might have appointed examiners if the project had commended itself to the council, and some weight would have attached to the certificate of such examiners; but the antagonisms introduced by the unhappy disruption of a couple of years ago have weakened its prestige, even if such a scheme should now be undertaken by the Society. The feasible project whereby a plan of granting certificates can be satisfactorily carried out is yet, we fear, to be discovered. If our correspondent can point out a satisfactory mode of obtaining a board whose diploma shall be accepted by the community as an authoritative test of ability, then the simplicity of the proposal will undoubtedly commend it; but failing this, we fear it falls to the ground.

TOUGHENED GLASS.

THE hopes which suddenly sprang into existence on the announcement of M. Bastie's discovery a few months ago, in enthusiastic minds, in relation to the numberless advantages to be derived from the use of glass rendered tough or malleable, are scarcely likely, it seems, on more careful examination of the facts, to be realized. The sanguine photographer foresaw glass negatives which would not break, and new lenses of special excellence rendered possible by the use of glass of increased density; whilst for the industrial arts generally the new material promised new powers which could scarcely be fully estimated. The wish was probably in great measure father to the thought. The idea of producing malleable or flexible glass has been a dream of the experimental mind for centuries, and vague traditions of such a substance have long been in existence. Hence, incompatible, as general experience has proved, as is the idea of flexibility, toughness, or malleability with the known characteristics of glass, a general tendency was manifested to accept and exaggerate the announcement of a discovery involving some of the desirable but incompatible qualities. On further examination it appears that, important as may be the discovery of Mons. Bastie, it does not involve the production of any of the qualities in glass which are likely to prove of vital importance to the photographer. Properly speaking, the glass is not toughened, and is certainly not in any sense rendered malleable. It is hardened, and rendered capable of bearing somewhat rougher usage without breaking; but it is not rendered unbreakable, and when it does break, it is not a simple crack which might be remedied; the fracture is complete and irremediable, and the glass is shattered to atoms. For negatives, therefore, its increased resistance to fracture would scarcely be a compensation for the completeness and irremediable character of the fracture when it does take place. A further serious drawback is found in the fact that it cannot be cut with a diamond in the usual way—a fatal difficulty so far as negatives are concerned. Neither is it likely to prove of value for optical purposes, as, so far as experience yet goes, glass treated by M. Bastie's process is not homogeneous in texture, a condition of vital importance in the manufacture of lenses.

It is probable that for glass baths and dishes for photographic use the hardened glass may still prove valuable, and possibly for other uses to be discovered in photography. In the meantime we refer our readers to an interesting communication on another page by Mr. Gaffield, to whom our readers have on former occasions been indebted for valuable information in relation to glass and its qualities in relation to photography.

ARTIFICIAL PHOTOGENIC LIGHTS.

BY PHOTO. CHEMICUS.

Your correspondent, Mr. Latchmore, suggests the light obtained by the combustion of nitre and sulphur for use in photography, and very correctly states that "the nitre must

be in a thoroughly melted state before the sulphur is dropped in." But has Mr. Latchmore tried the experiment of thus melting sufficient nitre (and keeping it melted) for the time necessary for taking a picture? Melting (say three or four ounces of nitre) is, to inexperienced hands, rather a ticklish operation, remembering that should organic matter (as, for instance, a piece of paper) come in contact, an amount of deflagration almost amounting to explosion would instantly occur.

But there is an equal if not superior light to be obtained without this danger, and literally without trouble or risk, by a very simple process: namely, to fill a small vessel of earthenware or metal with perfectly dry nitre, press down a cavity into its surface, and in this cavity place a piece of phosphorus; ignite this, and the heat given off melts a sufficient quantity of the nitre to evolve oxygen enough to combine with the phosphorus, and the effect is to produce the most magnificent white light which chemistry can afford.

THE DE BASTIE GLASS.

BY THOMAS GAFFIELD.

[We are indebted to Mr. Gaffield, of Boston, U.S., with whose communications on the effects produced by the action of light on glass our readers are familiar, for the following remarks on "toughened glass," which, with some slight modifications, have appeared in a Boston journal. The interest of the matter to photographers induces Mr. Gaffield to place these details before our readers.]

It is time that some one should set our newspapers right in regard to the manufacture of tempered or toughened glass by M. de la Bastie, of France. The journals speak of it as "unbreakable glass," and as "malleable glass," or "almost malleable." The inventor and his agents make no claim to the malleability of their new glass. The earliest account ever given of malleable glass is in a fabulous story told of Tiberias, the Roman emperor, that he decapitated the only man who possessed the secret of making it, and, I think, it has never been believed by any practical glassmaker from that day to this. At a more modern date, a similar story was told by a French writer, but no author or glassmaker ever speaks from personal knowledge on the subject. The story is sometimes repeated by imaginative lecturers on the so-called, and, in my opinion, wrongly called, "Lost Arts." Malleability and brittleness in glass (I mean in the finished article) are incompatible. In the wonderful discoveries and inventions of modern times, it is not safe to say that anything cannot be done. But, after handling glass from my youth, and having passed the half-century milestone, I give it as my opinion that we shall see white blackbirds as soon as malleable glass.

Again, the Bastie glass is not "unbreakable," and does not claim to be. It only claims to be tempered or toughened by being dipped in a heated state in some hot oleaginous mixture. All that can be said of it, and all that is claimed, is that it is much tougher than ordinary glass. It is not annealed in oil, as the papers say. Annealing is done by passing glass through annealing ovens, and reducing it slowly from the temperature of the heated and newly finished article (of glass ware or window glass) to the ordinary temperature of the atmosphere. The Bastie glass is tempered, toughened, or hardened, by being plunged when hot into a heated oily mixture, and then soon withdrawn, and not annealed; just as we plunge a piece of hot glass into a pail of cold water, and, by thus tempering it, form the Rupert's drop, which so puzzled the scientific people of England and other countries of Europe in former centuries.

As an interesting illustration of the remark that "there is nothing new under the sun," may I give a few quotations from old magazines and scientific journals?

In the *Gentleman's Magazine* for 1819 an article on "Tempering Glass" closes thus: "If the glasses are to be

exposed to a higher temperature than that of boiling water, boil them in oil."

In an essay on "Rupert's Drops," read at the Royal Society in 1661, mention is made of their being made in oil, instead of water: "In sallet oil, they do not miscarry so frequently as in cold water." In another sentence, it is said of a drop made in oil, and broken under certain conditions, that it "flies not into so small parts, nor with so smart a force and noise, as those made in water, and the pieces will hold together till they be parted."

Before the same society, in 1749, in an essay translated from the French, on "Rupert's Drops and the Tempering of Steel," it is said that "if the drop be ground with fine powder of emery imbibed with oil, it frequently happens that it does not burst, because the sort of oily mastic that results from the mixture stops the pores of the drop," &c.

I do not give these quotations to show any close analogy with Bastie's experiments, but that your readers may know that experiments with hot glass and oil have been made before our day and generation.

And now, may I not ask whether the Bastie glass is anything more than a Rupert's drop on a large scale? It is much tougher and harder than common glass, because unannealed and tempered in oil; but it is not unbreakable. It only requires a harder blow to break it than common glass. It is wrong, and false to science and truth, to compare it with iron or tin. I witnessed one of the exhibitions of the tests of the strength of this glass. To be sure, many specimens thrown on a wooden floor did not break. But some did, and were said by the exhibitor to behave badly. All will break if allowed to fall from a greater height; and, if thrown upon a stone step, which has no elasticity, they will sometimes break at a few feet. At least, the only specimen I ever saw in Boston broke on Briggs's doorstep in that way, although it stood other tests very well. But tin and other metals would not break in this manner at all, and therefore it is a misnomer, and an imposition upon the credulity of the public, to speak of it as being unbreakable as a sheet of metal.

Again, it is said that it can be cut and engraved like other glass. Now, this is not true. You can cut a piece of flint glass on the wheel through its entire thickness without danger of fracture. Grind a Rupert's drop through a short distance, and it will fly into a thousand fragments; and just so will the Bastie glass fly. I have seen a piece subjected to Tilghman's sand-blast process which burst into myriads of fragments after penetrating a slight depth into the surface.

Again, many of the specimens exhibited are not transparent, but only translucent, having lost their transparency, I suppose, in going through the transformation process, in being submerged in the hot oily mixture. Now, this is a great drawback, as the chief beauty of glass consists in its transparency.

Again, the Bastie glass cannot be cut with a diamond. This also is a serious drawback, especially in the use of glass for photographic negatives, or for window panes, which frequently have to be cut to special sizes.

Speaking of window glass leads me to say that the peculiar fracture of the Bastie glass would prejudice its general adoption by glaziers. Although it will stand a much harder blow than common glass, yet I think it would not be proof against the explosion of a neighbouring store, or against the impetus of a stone or brick thrown on purpose, or by accident. Now, in ordinary glass quite a saving is made from the large lights cut from the broken pieces, while the Bastie glass is shattered to splinters, and is a total loss.

A baking dish of this glass, if by accident it should be broken and explode its minute fragments in the oven, would make bad work of all its contents, as broken glass is a dangerous article of diet; while a stone-ware dish would be fractured in large pieces, which could be removed without injury to the loaf of bread or cake it might contain.

A SIMPLE METHOD OF PHOTO-MECHANICAL PRINTING.

BY M. ROGER LAURENT,

Civil Engineer, Aux Forges de Basse, Indre, Loire Inferieure.

ALTHOUGH I have read many French and English works which treated on helio-engraving, I have not met with the process here described, which may be termed a method of printing with greasy ink from a gelatine paper block. By means of this process it is possible to reproduce pen-and-ink sketches, drawings, engravings, and etchings of a very delicate nature upon paper, wood, stone, metal, porcelain, and glass.

While of a most serviceable character, it is a method within reach of all, and requires but very little material, only care, patience, and skill; and the occupation, moreover, is so light and agreeable that a lady might undertake it.

I will proceed forthwith with my *modus operandi*, and can assure those who will scrupulously follow the instructions I give that they are certain to obtain most successful results in regard to fineness and delicacy in the details of their prints.

Preparation of the sensitive gelatine paper to serve as printing-block.—1. It is necessary to choose a paper of good quality from a capable manufacturer—that is to say, free from every kind of impurity, supple, even, glazed, and water-resistant. I work with pieces the size of half a sheet of letter paper. 2. The gelatine chosen is that used by pastrycooks, and is of the best quality; it should be pure, white, diaphanous, and solid to the touch.

These two conditions are indispensable. To prepare a gelatine bath of 1000 grammes capacity, 130 grammes of gelatine are put into a litre of pure water to swell for a period of twelve hours, and in this way a thirteen per cent. solution is secured. The solution is brought about upon a water bath, and when the gelatine has all dissolved, the liquid is passed through a bit of fine linen, so that any impurity may be removed such as might work injury hereafter. Thus filtered, the warm liquid gelatine is put into a rectangular dish, either of porcelain or metal, of the size and form of the sheet of paper under treatment.

This dish is placed either upon a warm sand-bath or upon a hot water bath while the paper is faced with gelatine, the solution being maintained at a tepid temperature, so that the gelatine adheres well to the paper. It will not do to have the gelatine solution too hot, and I object to boiling it, because of forming air-bubbles, which must be avoided altogether upon the gelatine paper. If the solution is too cold the film will be too thick upon the paper, and the prints produced will lack delicacy. The bath is carefully skimmed before use, either by means of a quill feather or a piece of paper, which removes the skin formed upon the gelatine bath.

A sheet of paper about half letter size is, perhaps, the most convenient to use, and this is taken by two of its extremities and laid gently upon the warm solution in such a way that the middle touches the liquid first, and the extremities afterwards. Care is necessary in treating the sheet in this manner, so that no air-bubbles are formed, and none of the gelatine gets above the sheet of paper.

The sheet is allowed to float upon the gelatine bath for about thirty seconds; it is then seized by one of the corners, and lifted, not roughly, but quickly and without hesitation or pause, at one motion, out of the bath. This is one of the most delicate features of the work. The paper is allowed to drain for an instant into the bath, and then it is suspended vertically from the margin of a lath by means of a couple of pins.

Before floating another sheet upon the gelatine bath, it is always necessary to take the precaution of skimming the solution, to remove any air-bubbles or impurity on the surface. This skimming of the bath should always be done every time a sheet of paper has been gelatinized, as

the printing block will be spoilt if any foreign matter adheres to it.

The quality of the gelatine may be tested when it has set upon the paper, and there is formed at the bottom of the sheet a little cushion of gelatine; if this accumulation resists the pressure of the fingers, and feels elastic, and does not dissolve or break up, the gelatine is of good quality, and success may be relied upon. It may be remarked that the film of gelatine is thicker at the bottom of the sheet than at the top, and a careful operator may make use of this circumstance in reproducing pictures of more or less delicacy. A thick paper, also, has a thicker film of gelatine adhering to it than a thin one, and this fact should also be borne in mind, for the success of the process depends in a great measure upon having a film of gelatine of proper thickness.

As soon as the gelatinized sheets are perfectly dry, they are put carefully between the leaves of a book perfectly flat and even; for any doubling or breaking of the sheet militates, of course, against perfect results. The gelatine paper may be preserved indefinitely in this way, sheltered from damp, and may be sensitized as required in the bichromate of potash bath.

Sensitizing the gelatine paper.—The paper is floated upon a three per cent. solution of bichromate of potash for the space of thirty seconds. The sensitizing solution must be rigorously maintained at the strength mentioned, being made up by dissolving fifteen grammes of bichromate of potash in five hundred grammes, or half a litre, of water. The sensitizing of the gelatinized paper is conducted in the same way as the operation of gelatinizing above described. If, on lifting the sheet of paper out of the liquid, there are perceived underneath any bubbles, the paper may be lowered again without any inconvenience, a thing that cannot be done when the paper is being gelatinized. The paper is removed from the sensitizing bath, and hung up in a dark room to dry for a period of twenty-four hours at least. As long as the sheet is wet it is not sensitive to light; but the moment it dries great care must be taken to keep it from the light. The paper must not be used until it is perfectly dry, as otherwise the gelatine will leave the paper during the work. The sensitive paper cannot be kept long—at the most, for a week. It is best, therefore, to prepare it as wanted, for it deteriorates every day, until about the eighth day it becomes unserviceable. The best results are secured with a paper prepared with freshly dissolved gelatine, sensitized upon a new bichromate of potash bath, and used twenty-four hours after thoroughly drying. It is well never to employ paper until it has become perfectly dry, and I would recommend that the bichromate of potash should be used only two or three times, and should be thrown away after a week.

The exposure of the gelatinized paper to light will be treated of in my next communication.

ON A PECULIAR REFLECTION-PHENOMENON OBSERVED IN PHOTOGRAPHIC PORTRAITS.

BY DR. J. SCHNAUSS.*

It is not easy, without being able to show a photograph exhibiting this phenomenon, to give my readers a clear idea of it; but I will try. I will begin by stating its probable cause. It is known that a freshly-prepared and faultless silver bath often gives over-elaborate negatives with a good light—pictures which contain detail in the darkest shadows. If you work long with such a bath, without adding any fresh quantity of nitrate of silver, unfavourable modifications in its chemical constitution come to pass, which are known to us all, and which have a very marked influence upon the negatives prepared in the bath. The blacks become more and more intense, the shadows more transparent, and, in a word, the pictures become

* *Photographische Archiv.*

harder. During this period, before the bath produces hard pictures altogether, there are obtained portraits occasionally of a most singular character. The clothing, even when it is dark, is well rendered, but the face exhibits generally a uniformly dark tone, with glaring high lights, which are in no way to be anticipated from the favourably lighted studio. These portraits always appear as if the sitter had a sunburnt face, with a stiff shiny hat, reflecting like metal; while a freshly-prepared silver bath would have given a well-modelled portrait. The signs of an exhausted, or rather changing bath, are to be found in the face and hands of a portrait, the other portions leaving little to be desired.

A very busy photographer I know attributes the phenomenon to another cause, for he told me recently that it happened very often to him that he had to put freshly-prepared baths on one side on this account, and negatives shown me exhibited the above-named exaggerated reflections in the face of portraits which were otherwise of a darkish tint. According to him, the phenomenon was due to the distilled water employed. He drew his supply from a chemical laboratory, and, as soon as he changed the source, he produced once more a magnificent silver bath.

Although I have not examined the water complained of, I can easily imagine that some volatile substance may have contaminated it. For this reason I should feel obliged if any gentleman could inform me further on the subject, and explain under what circumstances he has met with the phenomenon, which must not be confounded with those seen upon under-exposed or over-intensified pictures.

Correspondence.

THE LAMBERTYPE PATENT.

DEAR SIR,—I decided not to take notice of all the little attacks my patents might be the object of, knowing them to be solid enough to outlive here, as they did on the Continent, all the doubts, threats, and insinuations thrown at them by envy or jealousy; but I am advised to answer, once for all, the articles published in last week's photographic press, so as to counteract the false interpretation which might arise in the minds of your readers by the misstatements contained in those articles. I write with reluctance for two reasons: the first is that I have to use a language very little known to me, and the second and principal reason is that I know a whole year's discussion on such a subject will be as useless and as tiresome to your readers as the one year's controversy of 1871 about the Johnson's patent, which cost a great deal of ink and bile without changing a whit the situation. This controversy might yet be continuing had you not thought it advisable to close it, so as to prevent it from becoming eternal. All patented processes have their enemies, but with this difference: that if the processes are worthless, they will have none but licensees to attack them; parties not having invested in them would not even think it worth their while to notice them; but if, on the contrary, the processes are all they are represented to be, licensees will be satisfied, whilst the few photographers who do not understand that brain-work ought to be as well remunerated as hand-work will run down those processes, which they would very much like to use, could they but have them for nothing. Hence the rage against patents. Success usually creates jealousy and enmity: failure never does. By looking through this week's advertisement, it will be seen that our licensees are satisfied with the process, and the attacks against their novelty come from parties who, never having seen the practical working of our new methods, are not competent to judge of their novelty or superiority. Allow me to answer, in a few words as

possible, the various articles of last week, beginning with Mr. Batho's paper in the PHOTOGRAPHIC NEWS.

Mr. Batho seems to have as much knowledge of patent laws as he has love for our patented process. Every one who claims to have a slight knowledge of patents knows also that a patent taken out as a communication from a person abroad is equally valid as a patent taken out by the original inventor; and if Mr. Batho takes the trouble to read carefully the patent once more, he will perceive that my patents are not taken in the joint names of Lambert and Clark, but by Mr. Melville Clark, Patent Agent and Civil Engineer, being a communication from abroad by C. L. Lambert. Mr. Batho continues by saying "the invention must be new; not used before, in a business sense, even by the inventor." Everybody knows as well as Mr. Batho that the invention must be new; but, although I cannot see what relation the last part of his phrase has to my case, I must say that Mr. Batho is completely in error, if a process has been kept secret whilst being perfected, and used and known to none but the inventor, as he will learn by taking advice of Patent authorities, who will also answer his other statement: "If a specification claim as part of the invention something not new along with something new, it will invalidate the patent." It is so when there are two different and separate claims, one being new and the other not new; but in a single claim you may describe two or more old things to make a new combination, producing something, or results, not produced before, or to produce some known thing or effect better, or more quickly, or more cheaply than produced before. For instance, you may describe two different known metals which, by a new combination, would produce a new sample of metallurgy. Bell metal is an example, and it would be a fit subject for a patent.

Let me here quote extract of an article by C. Stewart Drewry, of the Inner Temple, Barrister-at-Law, author of a Treatise on Instruction, &c.

"There is, in reality, hardly any other test of distinction in a patent than that of superior utility, when inventions run, as they frequently do, so close to each other that the distinction between them, disconnected from their relative results, is with great difficulty appreciable. It must be recollected that superior utility logically involves difference, because process A can have a certain and specific effect, and no more; and if process B does something more than process A, there must be of necessity a difference, or there could be no additional action. It is therefore fair, and, indeed, almost unavoidable reasoning, that if you find process B producing a better effect than process A, there is novelty, however trifling it may appear to the eye. The case of *Cravie v. Price* may be thought to furnish reason for saying that superior utility affords a ground for inferring novelty. In that case it was proven that the process of using cold blast in smelting furnaces with ordinary coal was common, so was the use of the hot blast for the same purpose; anthracite coal, or culm, was also known, and the use of cold blast for smelting with anthracite coal had been publicly tried, though unsuccessfully, but the hot blast had not been used with anthracite coal, and Mr. Gray claims as his invention the application of the hot blast to anthracite coal, and the patent was proved to be a valid one. It is quite settled law that a patent may be sustained for a new combination of old materials. A careful consideration of the cases upon patent rights also proves that the question that courts of law look at is this: Is there a difference? If there is, then, though it may be very slight, if utility is shown to be the result of it, judges will not act upon any theoretical views drawn from their inner consciousness as to the quantity of invention."

I claim an essential difference between Mr. Croughton's process as described December 24th, 1873, and mine; and I can prove, practically, that utility and advantages are the results of that difference. Allow me to compare both processes side by side:—

Lambert's Specification.

What I claim as the invention by the hereinafter in part recited Letters Patent is the method of applying a semi-translucent sheet on each side of a negative or positive, and of quickly and rapidly retouching on these surfaces as herein specified, which means, as will be seen in specification, this:— I use in preference a thin paper specially prepared with paraffine, and subjected to great pressure, and known as mineral paper, or any other semi-translucent materials capable of receiving the colouring matter to be afterwards employed. On these two surfaces I retouch by applying, where necessary, either on collodion side or on reverse side, an impalpable galvano-plastic powder with stumps, &c.

Croughton's Process.

Described in *PHOTOGRAPHIC NEWS*, Dec. 24th, 1873.

In elderly people the lines and texture of the face are far too marked in the enlarged negative. This can be softened and reduced by printing through tracing-paper. Strain the tracing-paper over the face of negative, so interposing a thickness of tracing-paper between the sensitised paper and negative. I always strain tracing paper on the reverse side of negative, as it serves to soften the printing, and is a capital medium for working upon with pencil to strengthen high lights. I can also deepen the shadows of drapery by using a brush dipped in Canada balsam 1 drachm, benzole 1 ounce; this making the paper more transparent in these parts, the light acts more quickly, and a great depth of shadow is the result.

Now, it will be seen by any fair-minded photographer that Mr. Croughton's process consists simply in retouching with pencil on a sheet of tracing-paper strained on the reverse side of the negative, and, for elderly people, to print through another sheet of tracing-paper, on which he does not retouch. Our process is as different to this as a negative is different from a positive.

On every negative, or positive, even landscape negatives, where there is no wrinkle or texture of faces, I strain on both sides a sheet of mineral paper, not so much to print through, which would reduce necessary lines and details as it would objectionable wrinkles, as to serve as a vehicle for retouching with impalpable powder applied with stump; the mineral paper thus employed on both sides of a negative having the effect of neutralising, by its optical combination, the defects due to the materials of which it is composed, and which, when seen separately, exhibits an exceedingly coarse grain.

In Mr. Croughton's process, all the retouching being done on the sheet of paper strained on the reverse side of the negative, will, being necessarily out of focus, produce muzziness, but not softness; and the application of Canada balsam on the same side will not only annihilate the pencil retouching already made, but will also, in rendering the tracing-paper on the reverse side of the negative translucent, allow the grain of the paper on the collodion film to print, thus producing coarseness. I claim, furthermore, that it is impossible to produce gradations of densities and lights by the use of Canada balsam, all oily substances spreading on paper. The intensification of a life-size head by the hard point of a pencil, as in Mr. Croughton's description, should take a hard day's work, and will always produce a granular effect; whilst the application of impalpable powder with large stumps will instantaneously produce intensification, and give prints completely free from grain, provided there is also retouching on the other side of the negative. I claim, furthermore, that the retouching, being only done on one side of the negative, as in Mr. Croughton's method, will never produce but poor results, never to be compared for beauty and softness to work obtained from negatives with our mode of retouching, for this very good reason: that spotting, lines, and details must be in focus, or made on the paper strained on the collodion side, whilst intensification and broad effects of lights and shadows must be out of focus, or on the paper strained on the reverse side of the negative. This is what constitutes our patented process, now under consideration.

I think it is not necessary to go into further details to prove to any fair-minded photographer that effects will be obtained by the Lambertype process infinitely superior to and in an easier manner than Mr. Croughton's method. Not wishing to tire your readers longer with useless controversy on this subject, I will offer a fair and honest chance to Messrs. Samuel Fry, Slingsby, Brothers, and Batho, to prove by work, instead of by words and insinuations, the truth of their statement that my process is the one described in 1873.

Independently of my standing challenge, and so that the amount risked be no bar to acceptance, I propose that either Mr. Samuel Fry, Mr. Slingsby, Mr. Brothers, Mr. Batho, or any other photographer sharing their opinion, or Mr. Croughton himself, accept the offer I am about to give. Messrs. Fry, Brothers, and Slingsby claim to have worked Mr. Croughton's method six months longer than I have practised my own, so they must be as good, if not better, operators than I am. Now this will be a fair trial of the real merit of the two processes in question, unless they prefer testing the validity of my patents in the competent courts of this land, which I am always prepared to do.

This is the proposal I make to settle this matter definitely. I invite any of these gentlemen, or others claiming my patented process to be the same as the one described in 1873, to meet me in London, so as to test the real merit of both methods. The party accepting this fair proposal will try to produce in the same length of time, and from any negative—positive or transparency—given, enlarged prints and negatives as good, as artistic, and as permanent by Mr. Croughton's described method as those produced by my process, the choice of judges, the kind of work, and other conditions to be as explained in my standing challenge in advertisement, but with this difference: that if the party accepting my proposal does not succeed in producing as good results by Mr. Croughton's method as those produced by mine, he will lose nothing. If, on the contrary, he succeeds in equalling the results of my patented process, I will pay £50, now deposited in the London and County Bank, Deptford, not to erect a pyramid, mosque, or any such trifle, to Mr. Croughton (whose talents have no greater admirer than myself), as suggested by Mr. Slingsby, nor will I pay the money to swell the conspiracy fund proposed by the same gentleman, as such a fund is illegal; but I will remit the £50 to the London Photographic Society, to be used for benevolent purposes as they may elect.

This being a challenge of £50 against nothing, we shall consider any further attack on our patents from parties not daring to accept our proposal, and thus stop all further useless discussion, as cowardly and not worthy of further notice. This trial will also prove the validity of our Lambertype patent, as it will show if there is or if there is not a difference in the two methods; as if there is a difference, and utility or advantage can be proved to be the result of that difference, it will prove the validity of our patents.

In answer to Mr. Brothers, of Manchester, who says, "How can a novice be able to add high lights?" &c., we shall answer that we do not claim that an unskilled hand will add effects not existing in original; but we claim that artistic skill is not necessary to strengthen high lights or shades already existing, by our process; as, instead of drawing, it is simple tracing which is needed, and that the man the most devoid of artistic skill, but possessing a little taste, will produce, in a few minutes, better results with our process than he could in as many hours with any other method.

I must also state that when Mr. Fry asserts that he has seen the practical working of the Lambertype process, which took several hours, he makes an erroneous statement, as we can prove, by the six photographers who were present, and of whose photographic knowledge Mr. Samuel Fry gives such a flattering opinion in your last issue, that Mr. Fry did not see the working of the Lambertype. Knowing in what capacity that gentleman came, we only showed him a finished Lambertype negative, and allowed him to assist in the printing and developing of chromotype, the same as we always do to visitors not licensees.

I notice with pleasure that those gentlemen attacking my patents, hoping they might fall into their hands free of charge, have not yet had the courage to say a word against the great advantages offered by my processes; perhaps they admit it is no use fighting against plain evidence.—

Yours respectfully,

LAMBERT

LAMBERTYPE.—REWARDS FOR INVENTORS.

DEAR SIR,—It is interesting and instructive to observe the keen interest which any real improvement in their art excites in photographic portraitists. The new methods recently brought from France, under the names of Lambertype and Chromotype, seem to attract universal attention. The common opinion seems to be that the processes are very good, but doubts seem to prevail as to the validity of the patent, and these doubts can only be cleared up in a court of law, by tedious and costly proceedings. Patent law, if one may judge by the varying opinion of counsel given on the same case, is not well understood by patent lawyers, so that the "glorious uncertainty of the law" is made tenfold more uncertain. For my own part, I am in considerable doubt as to whether I shall take a licence, or refrain from using the method in question, or, using it, risk the terrors of a Chancery suit.

But if I use the Lambertype process without a licence, I am in another difficulty, which the gentlemen whose attacks upon M. Lambert's patent appeared in your last seem to overlook. They all say that the discovery belongs to Mr. Croughton, who first published it. Some of them—and if one, perhaps many—have been using it a long time. Mr. Fry says he has used it a year and a half. As it is the legality of the patent, and not the goodness of the method, which is in doubt, they would doubtless have paid for the process if the patent had been good, and they had really been indebted to Mr. Croughton for it. This being so, are they not equally bound to pay something in meal or malt to Mr. Croughton? In proposing to abolish patents, it has often been urged that the true inventor would generally be rewarded by the voluntary generosity of the community. In this case it is distinctly affirmed that Mr. Croughton first published a valuable process which has been adopted by many. Has one of these gentlemen ever sent to Mr. Croughton a letter of thanks or a coin of the realm, or even thought about him until now, when he is useful to play off against M. Lambert? To what extent the use of paper on the negative may interfere with M. Lambert's patent probably a vice-chancellor will be able to say when it has been argued before him; but if Mr. Croughton's prior publication be the real origin of the use of this method, I think some tangible expression of gratitude to him is due from every photographer who has adopted it, and especially from those who have already publicly expressed their indebtedness to his paper.—Yours very truly, SIGMA.

TESTING VALIDITY OF PATENTS.

SIR,—Will you permit me, in the interest of a large section of your readers—I refer to amateur photographers—to offer a protest and suggestion. My protest is against permitting such a large amount of your space to be occupied by the discussion of the claims of a patent, which, if the letter-writers in your last believe what they say, does not need discussion. Mr. Batho, in a paper read at a society, and Mr. Slingsby and Mr. Fry, in letters in your pages, all affirm that the illegality of M. Lambert's patent is as "plain as way to parish church." This may be so or not; but if it be, why waste so much space in your paper in saying so? A thing so plain scarcely should need saying at all. Are these gentlemen like a timid schoolboy in the dark, who keeps repeating to himself that there is nothing to fear, to try and assure himself that he is not afraid?

I should scarcely have ventured, however, to ask you to insert this protest if I had not also a suggestion to offer. It is simply this: let any of the gentlemen who are so profoundly convinced that this patent is worthless, draw upon himself the fire of the patentee by writing to him saying that he is using the process without a licence, and intends to do so. If the patentee means business by the statements in his prospectus he will at once commence a suit, and a decision in a court of Chancery will at once

settle a question which will never be settled by discussions which have so little interest to many like yours truly,

AN AMATEUR.

ON THE PRESENT POSITION OF OPERATORS, ETC.

SIR,—After having been very many years in business on my own account, I was, from misfortune, a short time since, obliged to seek employment as an operator, &c. I advertised as usual, and received many letters from first-class houses, but as I had no "testimonials" all treated me with more or less suspicion. Now "testimonials" are not always quite reliable, as there are many employers who are not thoroughly practical photographers, and are therefore not competent to judge of the abilities of another. Under the present system the position of an operator is anything but enviable. A good man will, if he is allowed entire charge and management of his chemicals, produce good work even under difficulties of badly-lighted studios, &c., but he does not get the credit of it, and cannot, therefore, hope to gain a name while in a subordinate position—he is, in fact, entirely at the mercy of his employer; as he has to look to him for a "testimonial," his position is little better than that of a menial servant. I do not wish for a moment to speak disrespectfully of employers generally, but simply express my opinion that a more equitable system might be adopted, with advantage both to employer and employé.

I propose that two or three gentlemen whose principles and abilities as practical photographers are beyond dispute (yourself for one, for instance) would form a board of examination; there are many studios in London devoted to experimental purposes which might be adapted for the purpose (Rouch's, for instance). I propose two classes, viz., first and second class certificate; second-class certificate proving a man to be competent to operate under supervision; a first-class certificate proving a man to be competent to take entire charge of a business, good retouching to be considered an extra ability. Let the board of examiners charge sufficient for certificates to remunerate them for their trouble, time, &c. (say five guineas for a first-class and three guineas for a second-class certificate). There should be some standard of pay for operators (say from two guineas for second-class, and from three guineas for first-class operators, good retouching to command extra pay in either grade); hours of attendance 9 till 6.

I, for one, would enter my name for a first-class certificate with retouching, and I believe almost every competent operator would at once send in his name, as it would put them in a much better position; they would then only require a certificate from their employer for sobriety, honesty, industry, &c. Employers would, I should think, heartily join in the scheme; they could then engage an operator with much more confidence than at present, and it would shut out many "duffers" professing to be operators, or consign them to the tender mercies of the gentlemen who do the "frame and all complete for sixpence" business.—Yours, &c.

AN OLD PHOTOGRAPHER.

Talk in the Studio.

MR. VANDERWERFDE'S NEW SYSTEM OF LIGHTING.—Since we announced, some months ago, that a studio of an entirely novel and singularly ingenious and efficient construction, affording, so far as we could judge from examination of a model, beyond all comparison the best system of lighting which had yet been devised, we have received many enquiries on the subject, to which we could give no immediate definite answer. We hope in our next to be able to give full details, as we have just received an invitation to visit and examine the first completed studio upon this principle, which has been erected in Regent Street. Our readers may therefore look for full information in our next.

THE ELECTRIC NEWS.—A new weekly journal, devoted to

electrical science, entitled, "The Electrical News and Telegraphic Reporter," has just been commenced, under the editorship of Mr. W. Crookes. There is undoubtedly room for such a journal, and the great abilities and experience of the Editor promise success for the new venture.

PRESERVING WET PLATES DURING LONG EXPOSURE.—We have a method of preserving wet plates which is more simple and convenient than anything we have seen in print, and is as follows: flow the sensitive plate (without washing) with bath solution seven parts, glycerin one part, as you do a redeveloper, until it flows smoothly. Flow again before developing if the plate has stood long, and the developer will flow a little better than if it is omitted. Plates will keep two or three hours treated in this way.—*Philadelphia Photographer.*

BLISTERS.—Some brands of albumen paper are subject to blisters when taken from the hypo solution. To prevent this, remove the prints, when fixed, from the hypo into a dish of salt water (a handful of salt to a gallon of water) before the regular washing, and allow them to remain therein for several minutes.

To Correspondents.

G. M. F.—We do not approve of long soaking as a mode of washing prints under any circumstances; but if you prefer to try it, there are two or three imperative conditions to be remembered: first, the prints must have received a good washing in several rapid changes of water before the soaking; next, the water in which the prints are soaked should be in motion and constant change; and, next, the prints must be kept in motion, and kept from sticking together.

LANDSCAPE.—It is a difficult thing to state the fair charge for going out to take a negative, as so much depends on your ordinary charges and other circumstances: say a couple of guineas for the negative, and 5s. each for a dozen or half a dozen 10 by 8 prints. This would be moderate.

COLLODION.—You describe the common defects which characterize a horny, repellant collodion. The defects are most manifest when the collodion is new, and will gradually become mitigated as it gets older. In the meantime, add a few drops of water to each ounce, a drop at a time, shaking well between each addition.

OXFORD.—If you had stated details of the treatment your developed print had received, giving precise mode of production, we could have advised you with more certainty. It has the appearance of having been toned without having been perfectly washed after fixing. This would cause the discolouration. 2. The lighting of the card portrait enclosed is good. 3. Two parts of ether and one of alcohol. Take care that each is sufficiently highly rectified.

T. HAWKINS.—Dr. Hill Norris's dry plates are best developed by first applying plain pyro (a solution of about three grains to the ounce), and, after a trace of an image appears, pour off the solution and add to it a few drops of citro-silver solution, and apply again to the plate until the negative is fully developed. The citro-silver solution may be made by dissolving thirty grains of citric acid and twenty grains of nitrate of silver in an ounce of water.

HOPS.—The general cause of prints turning yellow is imperfect fixation or imperfect washing, in either case issuing in decomposition of hyposulphite of silver in the print, liberating sulphur and causing the formation of the yellow compound of sulphur and silver. Perfect fixing in fresh neutral hyposulphite of soda, used in the dark, followed by thorough washing in many rapid changes of water, will generally ensure to the print a tolerably long tenure of existence without change.

B. M.—Nitric acid is of course a much stronger restrainer than acetic; but its use tends to the production of a thin white image, not suited for negatives.

A. A. MANTRELL.—We are not familiar with the special sample of paper you mention, but blistering is a defect to which many samples of albumenized paper are liable in hot weather. It is most frequently found in very highly albumenized samples of Rive, which give great brilliancy. Some difference of opinion prevails as to the causes. So far as we can come to a conclusion, it is due largely to the thick coating of albumen being imperfectly coagulated throughout its entire thickness, and the portions not perfectly coagulated, being in contact with the paper, become dissolved during the processes of toning and fixing, allow the coagulated portions to leave the paper in irregular patches, forming blisters. Many remedies have been proposed. One consists in floating the print a sufficient length of time on a silver bath not too strong, to secure coagulation throughout the thickness of the film of albumen. Another plan consists in adding ether or alcohol to the fixing bath, or soaking in strong alcohol before toning. Another plan consists in immersing the print in a solution of alum immediately after toning and before fixing. You will find the subject much discussed in our YEAR-BOOKS for the last few years.

THOMAS HUTCHINSON.—Either boiling or sunning will effect a cure. If you have facility, boil for a few minutes in an evaporating dish, over a Bunsen's burner; then filter through pure cotton wool. If you have not facilities for boiling, pour the solution into a flat dish, and expose for a few days to the strongest sunlight which this curious summer weather affords. This will throw down the contaminating matter, and you will doubtless find the bath work all right. It is as well to neutralize by the addition of a trace of carbonate of soda before sunning.

J. HARRISON.—We have already more than once expressed an opinion of the Lambertype process. In autumn last we described details of the working which we had seen in Paris, and we exhibited in the Photographic Exhibition last November some charming examples. There can be no question that all, or the greater portion of, the parts have been employed before; but as we said nine months ago, they appear to have been combined by M. Lambert into a system which has not been used before. Whether this system is legitimate subject for a patent can only be decided by authorities learned in patent law; and these, we understand, have pronounced in its favour. 2. We cannot profess authoritatively to decide points in patent law; but, so far as we understand the matter, the writer of the paper to which you refer is in error on several of the points to which you refer. You may patent a thing which has been used for years in business purposes provided no publication have taken place. If you claim as new that which is proved to be old it may invalidate a patent; but the old method may be recited in your specification as a necessary part of your new method. The patent would not, of course, in such case give you any property in the old method. For your other queries, we must refer you to a patent lawyer, who will probably tell you that the validity or invalidity of any patent can never be decided until it has been well litigated, and will perhaps quote for your edification the famous protracted cases of the Betts Capesules Patent, in which, if we remember rightly, the patent was maintained, notwithstanding that all the parts were known before, but some slight modification in the combination was introduced which improved the final result. The new Patent Bill has, you have probably seen, been withdrawn for the present session.

L. W. W.—We cannot possibly answer your question in detail, as it is received just as we are going to press. But in any case you will do well to see the details of Mr. Vanderweyde's new studio, which will appear in our next, before you proceed further.

M. R. L.—Until you acquire skill by practice, float small sheets of paper, say quarter sheets, upon the silver bath. You will soon get over the difficulty of the air-bubbles. Take the sheet by opposite corners, lifting them so as to cause the centre of the sheet to curl downwards, lower it on to the solution, allowing the curved centre to touch the solution first, then gently lower the corners in such a manner that the paper, gradually coming into contact with the solution from the centre, naturally drives any bubbles formed to the edges, and finally away from the sheet. If you fear bubbles have formed under the sheet, gently lift it at one corner and remove them. The time of floating depends on temperature, strength of bath, and character of the paper, and may vary with circumstances from one to three minutes. Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

- Mr. J. RELEY**, Richmond, York,
Photograph from Painting of the Royal Prize Hunter "The Jester."
- Mr. DENNIS**, Tredegar,
Photograph of Tredegar Iron Works.
- Messrs. J. and T. TILLY**, Dublin,
Photograph of Marble Monument to Mary Jane Walker.
Photograph of Monument to Janet Sinclair Deanistoun Brown, in Arno's Vale Cemetery, Bristol.
- Mr. J. WITCHER**, Romford,
Two Photographs of Church at Wavering, Essex.
- Mr. H. LEWIS**, Southsea,
Photograph of Shed and Arctic Gear.
- Mr. J. BORDLEY**, Little Yorkshire,
Photograph of Life Boat "Demonstration."
- Mr. H. L. TILLY**, Southsea,
Photograph of Richard B. F. Jeffery.
- Mr. HOSGARD**, Coatham, Redcar,
Four Photographs of North York Rifle Volunteers.
- Mr. W. P. MARSH**, Bognor,
Photograph of William Bagleas.
- Mr. J. MARRAS**, Keighley, York,
Photograph entitled "Spirit Photography."
- Mr. W. E. JONES**, Clifton,
Photograph from a Painting of a Country Lane in Somersetshire.
- Mr. Reynolds**, Highgate,
Five Photographs of Group and Scenes in the Nicobar Islands.
- Mr. GEORGE BROWN**, Falcon Hotel, Brixton,
Two Photographs of Fossil Bones.
- Mr. J. BATHMAN**, Canterbury,
Two Photographs of Bishop Parry.

The Photographic News, August 6, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY AND STAGE MANAGEMENT.—MR. MOODY'S PORTRAITS.—PHOTOGRAPHS OF METEORITES.—COATING IRON WITH COPPER.

Photography and Stage Management.—In an article upon "Stage Costums" the *Globe* recently called attention to the progress that has been made of late years in the matter of dress upon the stage, and asserted that it is only within the last generation that any attempt has been made to ensure correct costumes in historical or other plays. In the days even of Mrs. Siddons, Mrs. Yates, and Mrs. Pritchard, Roman ladies on the stage wore hoops, and powdered hair and feathers, and the gentlemen were nearly as bad, for Garrick and Betterton never studied pictures of the period when they assumed their different parts. Now-a-days we pay considerable attention to the dress of the period, and the *Globe* thinks that this improvement is due to the advent of photography, which has "rendered great portrait painters' work so familiar to us." It is only the very first paintings that are engraved and circulated throughout the world, and there are many pictures, most valuable in showing us costumes of the period, which possess, however, little value besides. These pictures it is which photography has been the means of disseminating, and thus we have been placed in a position to know what dresses were employed in Venice, or Verona, or elsewhere, many years ago, and are enabled to mount our pieces at the theatre with more respect to truth. There may be no fixing dates to plays like Hamlet, Othello, and Macbeth, but that a silk hat, knee breeches, and a court sword, are rather out of place in such plays, everybody must admit. Fechter acquired much credit for appearing as Hamlet in a flaxen wig; for a prince of Denmark, Fechter argued, would probably have light brown hair, like most Scandinavians. He forgot, however, that the same rule would apply to the courtiers and all the supernumeraries upon the stage, and that the majority of these should also have worn flaxen wigs. In yet another way photography has materially aided the stage, and that is in the scenery. Stage painters need not have travelled all over the world to get an idea of the varied scenery of different countries, or the architecture and internal fittings of foreign palaces, and the like, where the action of a play is carried on. Photography has stepped in here very aptly, and a street in Milan, or a square in Seville, may be very truthfully rendered by a scenic artist who has never been near either of those places. As much care is now-a-days bestowed upon mounting a play as in choosing it, and it is not unfrequently the case that the stage manager is aided in the task by an artist of repute, to whom the design of the dress and appointments is left. A study of old paintings, or photographs of pictures, and of nature, naturally afford the most trustworthy assistance in the matter, and for this reason we have no doubt that the *Globe* is perfectly right in its assertion that the improvement in the truth of our dresses and scenery upon the stage dates from the invention of photography.

Mr. Moody's Portrait.—It seems that Mr. Moody has an insuperable objection to a photographer taking his portrait, a crocheted evidently not shared by his companion, Mr. Sankey, whose photographs are to be seen very frequently in the shop windows. It is for this reason that one has observed nothing but a fancy portrait of the reverend gentleman for sale, a production which we should have thought Mr. Moody himself would have been glad to see the last of, even at the sacrifice of his sitting for his picture to a competent photographer. It would surely have been better to have foregone one's prejudice rather than have such libels scattered broadcast as many of the Moody pictures are. The portraits are wonderfully well got up "for sale," and many "country cousins" coming to town must have purchased them under the idea that they really were portraits taken by the camera, instead of only worked-up sepia prints, reduced by means of

photography, and glazed and mounted in carte-de-visite form. On the authority of the chairman of Messrs. Moody and Sankey's committee we hear that "during Mr. Moody's visit to this country he has steadily refused to sit for his photograph, though frequently tempted to do so by large monetary offers, and that eight years have elapsed since he consented to have his photograph taken, which was then done only for family uses. Mr. Moody deeply laments the unauthorised circulation of his photographs, many of which are rather caricatures than likenesses, and he is still more pained by the publication of books giving accounts of his life and work, which are every one of them issued without his consent and contrary to his wishes." A little while ago we commented on the large sums of money that must have been realised by the sale of photographs of notable persons, and we are not at all surprised to hear, therefore, on the authority of Mr. C. D. Cooper, of Edgbaston, Birmingham, that "during the visit of Mr. Moody to this town the large sum of £1,000 was offered to him to sit for his photograph, which offer he unhesitatingly declined, and told me that he would give £500 to be able to prevent the portraits being sold." We think it was a pity Mr. Moody did not close with the offer made to him, or look out for a better one, as the money would have doubtless been very welcome in furthering the cause of these gentlemen throughout the kingdom. The expenses of building temporary halls and printing tickets were, we know, very heavy, and a material addition for the liquidation of these expenses would in this way have been secured. As it was, however, Mr. Moody suffered annoyance by a large number of spurious photographs being foisted on the public, for the latter would have bought the pictures, whatever their nature, while the money he might have had for carrying on his services simply went to enrich those who were acting in opposition to his expressed wishes.

Photographs of Meteorites.—In the last number of the *Geological Magazine* there is a paper by Dr. Flight "On the History of Meteorites," and the author makes use of photography to exemplify the nature of meteoric iron in comparison with other iron. When the surface of a piece of meteoric iron is polished, and subsequently etched, either by water saturated with bromine, as Dr. Flight has treated his specimen, or in any other approved manner, there are to be seen markings of a peculiar form, crossing each other in all directions, in place of the regular fibre which is developed on etching an ordinary iron surface. These markings may, naturally enough, be photographed, and Dr. Flight has accordingly illustrated his paper with a carbon print showing the marks, or Wildman-stätten figures, as they are called. The particular meteor he shows comes from Toluca, in Mexico, and there is no doubt that this simple plan of etching the metal is one of the readiest and most conclusive tests for meteoric iron.

Coating Iron with Copper.—A simple and effective method of coating iron or steel with copper is given in the *Polytechnisches Journal*, the details of which may be of interest to photographers, since the rusting of iron and steel articles is often a vexatious circumstance. Dipping iron into a sulphate of copper solution will sometimes bring about all one may desire; but to ensure a substantial coating, a more complicated method is necessary. A fused mixture consisting of one part of chloride of copper, five to six parts of cryolite, and a little chloride of barium, is prepared, and the object to be coated is dipped into it. To hasten the coating process, it is well to bring the dipped object into contact with the negative pole of a battery. Another plan is to dip the iron or steel in a solution of oxalate of copper and bicarbonate of soda, made up with ten to fifteen times their bulk of water, and slightly acidified by means of tartaric or oxalic acid. Another plan still, described in the *Journal*, is to dip the object into fused copper, the surface of which is covered with a flux of cryolite and phosphoric acid, the iron being first of all heated to the temperature of the fused metal. Cryolite, we may mention, is a native fluoride of sodium and aluminium.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XII.

THE GLASS HOUSE FURNITURE AND ACCESSORIES.

As I said in the last chapter, let a little tasteful adornment make the glass house cheerful and pleasant to the eye; nor need there be any extravagance to accomplish this. The walls and unglazed portion of the roof may be painted in one of the many greys which are so very pretty, avoiding a tint, of course, which casts troublesome reflections. A simple decorative bordering, while adding little to the expense, gives a finish and beauty it should be our object to secure. Many object to painting the walls on account of the outlay, but supposing it is our object to *keep our studio clean and bright-looking*, it is by far cheaper in the long run than paper, as it not only wears better, but may be cleaned, and has in itself more elements of beauty than even expensive wall-paper. Pictures for the walls are a great adornment, but, in advising their introduction, there arise several objections; they are not absolutely necessary, and good pictures have a value which sets them beyond the reach of everybody, and it is so easy to mar the most handsome room with rubbish. If you have pictures at all, let them be examples of art—it will be edifying to you to study. Engravings of the studies of good masters are perhaps the safest and wisest purchases you can make, and I am of opinion their influence in your gallery will not be thrown away. Then, in specimens of your own work in tasteful display, you can do a great deal to relieve the monotony of bare walls.

A frame of specimens of the different styles of pictures made is very useful to assist the sitter in his choice when undecided.

BACKGROUNDS

are of great variety—some in good taste—others, *most*, quite the reverse. In a portrait, though the head is of first consideration, the background should have some thought bestowed on it, and a plain, uniform background is the very worst you can have.

A carefully graduated background is one of the most useful you can select, so that you can secure relief and contrast to the figure.

A background painted to represent the effect of light falling on a grey cone is one of the best forms of ground for head and bust portraiture, the lighted portions of the figure being in contrast with the darker shade of the ground behind, and the shadow side being relieved by the lighter shade of the background. This style of background is a very good substitute for the cone itself (having the advantage, too, of being lighter and more portable), though the cone admits of more variety of illumination. For the benefit of those who have not seen or read any description of the conical background, I will explain its construction.

The Conical Background.—A circular piece of zinc, cardboard, or other material, of five or six feet in diameter, is slit to the centre; by overlapping the edges of the cut, the centre of the circle is thrown back, and the outside of the circle is contracted in size, but retains its circular shape, assuming the conical form. Fixed in this form it is mounted on a head-rest base, in which it may be moved up and down as required.

The effect, when placed behind a sitter, is to produce shadow on the conical background, where the light strikes the sitter, and *vice versa*. The explanation of this may be understood in a moment, the edge of background nearest the light casting a delicate shadow, of more perfect gradation than the most cunning brush can produce, and the opposite side of the background, that farthest from the light, and behind the shaded side of the sitter, is illuminated by the rays of light falling on its surface.

Scenic Backgrounds are generally to be avoided as a dangerous experiment, except where they are the work of an artist, and used by an artist. They should always be suggestive, rather than the sharply-defined and thoroughly

unnatural backgrounds too often seen in photographs. For an interior, the effect of light shining through a case—ment half hidden by a projection, or piece of massive furniture in shadow, may give variety, which will prove agreeable—but be careful that the natural light falls on the sitter in the same direction as that pictured on the background.

ACCESSORIES.

In the introduction of accessories there is scope for great artistic taste.

For *exteriors*, rocks, stumps, shrubbery, gateways, &c., may be introduced with good effect, with a background suggestive of the open air. One of the great dangers of the introduction of accessories is over-doing it, bringing together a lot of incongruous objects, which must be avoided at any risk.

For *interiors* there is greater variety—and greater danger—of overcrowding chairs; tables, statuettes, pictures, curtains, hassocks, &c., will be found effective if judiciously introduced.

The *posing chair*, or high-backed chair, for standing figures, is a very useful accessory, but one generally abused, for, as a rule, where it becomes an adjunct of the gallery, it thenceforward enters into all the pictures. In using it let the pose be made that the figure rests on it, not leans, whereby a stoop is introduced, and the lines of the drapery are destroyed.

The curtain of silk or repp is also a graceful accessory when not used too often. By it many beautiful lines are introduced into the picture, and it is often of great use in hiding and breaking up ugly lines, and for hiding the lower portion of the rest.

THE POSING PLATFORM

is very valuable, as by it a sitter can be moved to adjust the illumination without being disturbed. It is a structure resembling a table-top on castors, on which the sitter's chair is placed, with two upright handles by which the sitter can be wheeled to any part of the gallery without alteration of the pose. Nothing is so annoying to sitter and operator alike than that every trifling change necessitates disturbing the subject. A favourable and easy pose is often lost, because a change of position is necessary for better illumination, and the trouble and fear of annoying the sitter often excuses the operator seeking to secure a better light, by a movement of the posing chair; whilst the adoption of the platform would obviate all the annoyance, and much of the operator's labour.

SCREENS AND REFLECTORS.

The light may be modified and directed to a very considerable extent by the aid of screens and reflectors, and by their judicious use an awkward light can to a great extent be controlled. Even the exaggerated effects produced by the top light and the side light may be obviated.

With the *top light* alone, the effect is to exaggerate the projections of the brows, cheek bones, and nose, and to give the eyes a sunken and deep-set appearance, by the heavy shadows cast by those projections. Here a screen of one or two thicknesses of tissue paper fixed over the head of the sitter tends to reduce the severity of the downpour of light, while reflectors are placed at such an angle as to reflect light into the dark shadows, care being taken not to entirely destroy them or produce false lights.

The *side light* produces a "hatchet" expression, the face assuming a wedge-shaped appearance, in consequence of the light, strong from one source and lacking diffusion, striking that side of the face nearest it, and causing a sharp shadow on the other side, giving a flat appearance to both. Here a reflector above the sitter, placed at an angle to catch the light, reflects it down on the sitter, and causes the diffusion of rays we get in the combined top and side light. Reflectors on the shadow side aid in the modelling of the face. In these extreme cases I have roughly sketched the uses of screens and reflectors, but even with the best working light they are great aids to the artist.

Lighting-up dark shadows reflectors give roundness and modulation to the face; but the effect should be carefully

watched, that too much light is not reflected, whereby the shadows are cut up and destroyed.

The best form of reflector is a light frame on which is stretched white calico or paper, set on centre-pivot, an upright movable stand, so that the reflector will move to any required angle.

Screens may be of the same form, tissue paper being substituted for the opaque calico or paper. One of the tissue paper, stretched on a hoop or light frame for shading the top of the head from too strong top light, should also be provided.

THE PRACTICAL PRINTER IN AMERICA.

XXXIII.

CAUSES OF FAILURES IN ALBUMEN AND PLAIN PAPER PRINTING.

In this chapter we shall give the causes and the remedies of the failures that are constantly occurring, both in albumen and plain paper printing.

Albumen Paper.

There is considerable fault found with some of the albumen paper which is in a great measure unnecessary.

Now, there is no paper manufactured and successfully worked by a few photographic printers, but that can be worked by a great many if they were to try to work it, and not discard it if the first (trial) sheet should not happen to work as it might be wished by the printer.

There is no necessity for sensitizing, the very first thing, six, eight, or a dozen sheets of paper, the working of which the printer is unfamiliar with, and then, because it is sensitized, to print and tone it all up.

Do not keep on printing day after day when the paper is working badly, but stop off short, even if the best part of a day is wasted, and work constantly in every way and manner until you are through with your difficulty, and then your work will again be excellent.

There are some faults, however, with the albumen papers which rightfully give them the name of poor paper, and such I will here give.

Uneven Albumenizing.

This unevenness in the albumenizing of the paper can readily be seen by examining the paper, and noticing how much thicker the albumen is on one side of the sheet than it is on the other.

This unevenness will sometimes affect the resulting prints of the same negative printed on different parts of the same sheet of paper, some of the paper being much more brilliant than others, which is accounted for on the ground of the albumen being thicker on the paper on which the more brilliant prints were made.

Paper Repelling the Bath Solution.

The albumen on the paper is too dry and horny. Let it remain in a damp and rather cool place over night, and be sure and float the paper when it is damp, and not let it remain in a warm room before floating, if it is only for a few minutes, as it will immediately become horny again.

Tear-Drops.

These are caused by the same reason, and, in fact, are often the result of the above. The tear-drops accumulate in spots over the paper, and when the rest of the paper is dry these spots will not be so. To avoid it in future, have your paper damp and the bath not too strong; and to save the paper on which these spots already have appeared, blot the superfluous solution with blotting-paper. Drawing the paper over a glass rod will often cure it.

Albumen Spots and Streaks.

These are caused by carelessness in albumenizing; the spots by albumen spattering on the paper, the streaks by the albumen running zigzag when the paper is hung over a line to dry. These streaks are generally in the middle of the sheet, and run either in the direction of its length or width, and very often diagonally.

Metallic Spots.

These are found in almost all of the albumen papers that I have used, and owing to the partiality which the Rives paper has for it, the Saxe paper is very much preferred by many photographers, as there is none found in that particular paper. It is occasioned in various ways: often in the drying of the freshly-albumenized paper. When so caused, it is owing to clouds of iron-dust, which are set in motion by draughts, &c., which settle on the paper, as before said, while drying. The (iron) dust generally occurs from the iron rust on the stoves which are used in keeping the rooms hot for the purpose of drying the paper, or from the machinery.

Metallic spots occur also from some local cause in the printing room, probably while drying, after it is sensitized on the printing bath. The gas stove, which has become rusty (varnish it all over when it is so) either from drops of water which have been carelessly spilt on it, or from dampness of the air, detaches some particles of it in the air by the draughts, which are numerous as soon as the stove is lighted, and, settling on the paper while wet with silver, will cause a very decided metallic-looking spot or stain on the paper, and which appears to be more of a stain caused by the iron-rust coming in contact with the silver, than it does like a piece of iron-rust; and, as a very small speck of dust of this nature will cause a large stain, we are led to believe that the metallic spots are developed or decomposed on the paper, and thus, if there should only be a small cloud of dust of this kind in the air, it would finally be productive of disastrous results. This kind of dust is easily told from that which occurs in the manufacturing of the plain unalbumenized paper, or in the albumenizing of the plain paper, by picking out a few of these metallic spots with a needle, and then, if the spots have accumulated in the manufacture of the plain paper, they will be found deeply imbedded in the paper, and beneath the surface of the albumen, and from the appearance of the dug-out place I am led to believe that small particles of machinery, which are at times flying through the air, imbed themselves in the paper, and thus occasion the smutty appearance of the holes which have been left when the metallic spots are dug out. If they occurred in the albumenizing, they will be superficial, and before the paper is silvered will be very faint in appearance; but after it is silvered they will be brought more fully out.

When the dust has got on the paper, when freshly sensitized, it will have a freshness and brightness that will readily tell the examiner when it got there.

Failures in Preparing Plain Paper for Printing.

Good paper for plain paper printing can be had by using the back of albumen paper, as the salt which is mixed with the albumen in the albumenizing of the paper will, in conjunction with the albumen, make a strong print without any necessity for any more salting. I have obtained fair results by the use of the above, but have used paper prepared as given in a former chapter with greater success; but in case of emergency the other way will answer.

Anderson recommends for salting a solution of five grains of chloride of ammonium to the ounce of water. He says nothing about the use of gelatine in the solution, but I find that the prints are much better if a couple of grains or so of the gelatine are added to every ounce of water. An india-ink artist also informs me that the paper works better with it than without it.

If the prints have a sunk-in appearance (and you are certain that it has that appearance), then the salt is used in too large a quantity in the salting. If they are flat and mean-looking prints, then the reverse is the cause. If the plain paper prints are coarse, you have used the wrong side in sensitizing, and if that is not the case, then you used the wrong side in floating on the salting solution. If the coarseness appeared after the final finishing (i.e., after it has been mounted, and before it has been worked up), then the paper has been subjected to too harsh alkalies,

probably in the toning bath. If you cannot get a print on plain paper—i.e., no signs of decent printing—probably the paper has not been salted. To determine if a paper is salted, taste a corner, and if it taste saline, then it has been; if it does not, then the reverse. If there are transparent spots all over the plain paper, you have probably handled it with greasy fingers. These disappear when finished.

A SIMPLE METHOD OF PHOTO-MECHANICAL PRINTING.

BY M. ROGER LAURENT.*

Exposure of the sensitive gelatine paper under the negative.—

This process is based upon the circumstance that bichromated gelatine after exposure to light loses the property of swelling up in cold water, and easily retains the printing ink applied to its surface. If, therefore, we expose to sunlight under a negative a sheet of gelatinized paper that has been treated with bichromated solution, those portions of the surface which the light has acted upon will have lost the property of swelling in cold water, and allow of ink adhering; while those parts, again, upon which the light has not been able to act, still retain the power of absorbing water and repelling fatty ink.

It is useless to employ a mediocre negative, for this would be simply wasting one's time and money; the cliché must be really a good one, sharply focussed, clean and transparent, the shadows translucent, and the highlights opaque. This is absolutely indispensable. If it is deemed necessary, I will indicate further on how to secure a cliché well adapted to the purpose, but at the present moment I will suppose I am addressing a reader familiar with all the details of photographic manipulation.

A sheet of the sensitive gelatine paper is put under a negative in a printing-frame; a north light is preferable, but if the plate is exposed in the middle of the day to direct light, it is necessary to put over the glass a sheet of tissue paper or ground glass. The printing must be watched with care, the progress made being checked from time to time, until one sees the picture appear in all its details, and of a fine golden sepia tint. The operation is then at an end, and if not stopped, the surface of the paper gets burnt, and the ink adheres everywhere. At the same time all the details must show, otherwise the ink will not properly adhere to them.

If, after a suitable exposure, it is found that the ink does not adhere in certain portions, this is because the gelatine is too thin, and the next impression should be taken on the lower part of the sheet of paper, where the gelatine is thicker. After exposure nothing should be allowed to touch the back of the sensitive paper.

There are other precautions to be taken. As a matter of course, it is necessary that the film of gelatine when in the printing-frame touches the negative film in every part, and has beforehand been very carefully dusted. Unless this is done, the prints will be flat and bad. Round the margin is left a space of half an inch, which is required for purposes, hereafter to be described.

Fearing to fatigue the reader, I will not trouble him with any more remarks upon the exposure of the paper to light, although it is a most important operation, as the quality of the prints depends upon the proper solarisation of the paper. At the present moment we are in want of a good fairy to tell us the favourable moment when the light has acted sufficiently. I repeat, if it is necessary, I shall be happy to give some further details as regards the quality of the gelatine, the nature of the exposure, and the production of reversed negatives upon gelatine; for it must be mentioned that only reversed negatives can be employed in this process.

Before inking the block.—After exposure in the printing frame, the gelatine paper may be kept till the morrow in a book carefully screened from light; but it will not do to preserve it beyond four-and-twenty hours in this condition,

for, as photographers know, the action of the light continues. It is best if impression is put at once into cold water, to swell the gelatine and to remove the soluble chromate. The paper is left in the water until all the bichromate has been removed, the rinsings being renewed two or three times. This operation will take ten minutes or a quarter of an hour, the unaltered portions of gelatine swelling with the water they have absorbed. The sketch then appears finely engraved upon the surface of the paper.

As soon as the paper block has lost its yellow colour, it is withdrawn from the water, and applied at once to a thin glass plate, the picture uppermost. With the palm of the hand any air-bubbles are pressed out that are seen through the back of the glass, the atmospheric pressure causing the paper to adhere closely to the glass plate, which is indispensable in order to ink well. A sheet of filter paper is pressed upon the image, or, if preferred, a very soft rag, to remove the excess of water, it being necessary that the film of gelatine should be moist, but not wet.

In this condition, if the plate is held up to the light horizontally, and the exposure has been well timed, the picture is seen very clearly delineated or engraved, and the careful, patient, and persevering operator will begin to receive his reward, and be encouraged to continue his attention until the most difficult portion of the work has to be undertaken. The inking up of the impression is begun with the finger, and finished off with the lithographic roller.

Inking the block.—The ink employed is ordinary lithographic ink mixed with a little varnish (boiled linseed oil), which is worked up with a glass mixer upon a thick glass plate. The block or print having been wiped, so that no drop of water remains upon the surface, a little of the ink is rubbed upon the gelatine with the end of the finger; the finger is tapped once or twice upon the ink coated glass, and then applied a little at a time to the block. To begin by applying a lot of ink is a very great mistake. The finger is pressed lightly over the surface of the block to apply a little ink all over. The finger is then well wiped, and passed over the block again; the block is rubbed always in the same direction across the lines, and in this way the superfluous ink is removed from the swollen portions of the gelatine, while it still remains adherent to the lines and hollows, if the exposure given has been sufficient. Then a wet sponge is passed over to clear the whites as much as possible, the sponge being shaped like a small egg. If the ink refuses to be removed from the whites, it is a sign that the exposure was too long, or the paper employed was too old.

It is necessary to work rather fast in order that the film of gelatine may remain in a moist condition, and if it becomes too dry a wet sponge may be passed over the print again, the latter being afterwards wiped with blotting-paper before the ink is applied.

As soon as the sketch appears clean and sharp under a magnifier, and the whites clean, it is ready to be placed in the printing press. I will describe the one I employ, which is a very simple affair. It is composed of two iron cylinders rolling one against another, as in the presses employed by photographers to mount and glaze their pictures. The cylinders are ten to twelve centimetres in diameter, and thirty centimetres long, and they are covered with a film of india-rubber one centimetre thick. This rolling press is placed upon a table with a platform in front and behind of the height of the point of contact between the two cylinders to receive the print on its entry and exit from the press, which is put in motion with a handle turned by hand, as everyone who has used these presses knows very well.

The lithographic rollers that I use for inking the block after the ink has once been applied are of copper, and perfectly smooth and even. They measure eighty centimetres in diameter, and eighty centimetres long, and are made up of several thicknesses of flannel. Such rollers are to be purchased at all lithographic printers, who will

show the manner of using them. A good roller is necessary for the production of good work.

Inking and printing.—The inked block is taken from the glass plate on which it has rested, and placed upon a thin flat sheet of zinc, slightly moistened with water with a damp sponge, the gelatine surface uppermost, and care must be taken that the block does not slip during the rolling.

Above the inked block is placed the white paper to receive the impression, and between the two is adjusted a mask of paper, so that the print shall have a clean margin all round it. Above are put a few thicknesses of paper by way of a pad, and a thin glazed piece of cardboard, and then the two surfaces are carefully pressed together. On its exit from the press the printing block is separated from the impression with care. If the pressure has been sufficient, all the ink will be found to have left the block, and become transferred to the paper.

The block is put into water for an instant to absorb moisture again, and is inked once more. This time, however, the inking may be done with the lithographic roller. The first prints are not, as a rule, very good, and it is only after three or four impressions that the best copies are pulled off. Some care is necessary at the commencement of the operation in rubbing the whites clean with the finger and the wet sponge, and the latter should be always handled with a circular movement. If the block shows a tendency to lift from the plate during the operation of inking, it must be re-applied after moistening with water, for the inking cannot be well done with air-bubbles present.

The inking is now done with the lithographic roller; and if this is a new one, it is necessary to roll it well in some varnish (boiled linseed oil) some days beforehand, to make it supple, and to prevent the ink drying upon its surface. When the roller is thoroughly moistened with the varnish, it is scraped with a knife, with the grain of the leather, to remove any excess. It is rolled over the glass plate upon which the ink is, several times, and is then rolled upon a clean plate to mix the ink and remove the excess. The roller thus lightly charged with ink is passed over the block in every direction without bearing too much upon the gelatine film, which must not be worked too hard. When the block has been well inked in this way, it is cleaned with the finger, or with a damp sponge. Afterwards another roller is passed over, with no ink, which has first been passed over a clean plate, and this roller, on going over the block, receives any ink attached to the swollen parts of the gelatine, while it leaves that in the lines and in the hollows. The effect of this rolling is quite magical, for the print is made clear and sharp. The damp sponge is passed over the block, the latter dried carefully with filter-paper, and then the printing is proceeded with in the press.

Inking with the roller is better than inking with the finger, as the result is more uniform, more regular, and more delicate, and consequently the impression is sharper. The printing may be done either upon sized or unsized paper, but the latter takes the ink better. If the paper is glazed before printing, a better result is secured. With India paper the results are magnificent. A well-inked impression, which is clear in the whites, and which has been stretched on a wood block to dry, is a picture to be seen to good effect when framed and glazed.

I do not pretend to say that the process which I have here described will rival commercially the heliographic methods which are practised on a large scale, but, at the same time, I may modestly remark that it will be found of great use to amateurs, to engravers, and to artists. It is possible to print neatly not only upon paper, but upon fabrics, upon silk for screens and veils, upon wood for engraving, upon lithographic stones for printing, upon metal, upon porcelain, and upon enamel, as I am prepared to show in subsequent communications, which may, I trust, be read with interest by the numerous readers of the PHOTOGRAPHIC NEWS.

PHOTOGRAPHIC NOTES.

BY M. L'ABBE LABORDE.*

Substances modified by light.—The number of substances which are very sensitive to light is exceedingly limited, and as there is little hope of finding any more, it is best to confine one's investigations to those which favour sensitiveness, or aid its effects. As regards those substances which are modified after long insulation, their number may be said to be unlimited. It is, nevertheless, well to make known all that are discovered, for, at some time or other, photography may be able to make good use of them.

I may mention hardened rubber as a substance which appears to be slightly influenced by light. If, after having been covered with a piece of tinfoil, or lead sheet, it is exposed in part to light for five or six hours, it assumes, under the influence of light, a slightly matt tint, a black much less brilliant, that is very perceptible, on comparison with other portions that have been covered. I am disposed to attribute this effect to the sulphur which has been added to harden the rubber, rather than to the rubber itself. As a practical experience, it follows, that if it is desired to maintain the black glaze of ebonite or vulcanite articles, these things should be kept away from a bright light.

I am now going to describe a curious experiment which indirectly touches upon photography, and all those who have a negative at their disposal may repeat it. The glass negative is held up between the spectator and the daylight at a convenient distance, so as to be seen distinctly. A certain point in the image is fixed upon, and the observer is kept looking at this for the space of about half a minute. The eyes are then brought upon a sheet of paper at a convenient distance, placed in the shade, and the observer will then see a *positive* of the image before him. The image is not a very distinct one, it is true; it looks as in a dream, and it disappears at the end of a few seconds, but may be made to revive by closing and opening the eyelids two or three times.

The sensitiveness of the retina has been slightly acted upon when the bright rays traversing the image have struck it, and the white surface, which is afterwards reflected upon it, appears less white in those parts where the sensitiveness of the retina has diminished. For this reason it is that the observer sees a positive image. The retina has to some extent played the rôle of the sensitive paper put behind a negative. Such is the most rational explanation to be given to a physiological fact, but nothing prevents photographers from claiming it for themselves, by admitting that there exists a photogenic substance capable of being darkened momentarily under the influence of light. This may be advanced without in any way admitting the truth of such a nonsensical proposition as that the image of an assassin may remain printed in the eye of his victim.

What renders the experiment I have cited more curious still is the circumstance that on receding from the screen upon which the image seems depicted, but still keeping one's eye firmly fixed upon it, the picture appears to grow bigger and bigger, while it is reduced in size as the observer approaches the sheet of white paper. It is, therefore, at the back of the eye that we feel and perceive the image, which increases or diminishes in size according to the distance at which it appears to be seen.

An illusion, something of the same kind, is to be seen sometimes when looking out of window. It appears as if an animal of gigantic proportions is flying through the air across the landscape seen through the panes of glass; and after a time you find it is only a fly that is moving rapidly over the glass. The insect at first appears of such dimensions as if it were at the distance imagined, and it is only when the truth is known that you re-form your judgment.

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METHYLAL AS AN ACCELERATOR.

FURTHER experiments with the addition of methylal to the iron developer appear to more than confirm the first conclusions as to its value as an accelerator. In remarking that the favourable conclusions are more than confirmed, we mean that the amount of acceleration is greater than at first appeared. Methylal appears to possess the peculiar quality of powerfully restraining reduction where light has not acted, without in any degree retarding it where light has acted. It thus permits the use of a very energetic developer without any risk of fog or abnormal reduction. Even a saturated solution of the iron salt may be used without risk, the shadows of the negatives showing no sign of reduction whatever. Energetic development is, as experienced photographers know, one of the surest aids to reduced exposure which can be relied upon. The shortest possible impact of light, it is probable, produces a latent image on the sensitive plate, if a developer sufficiently energetic and sufficiently under control were at hand to develop it. The concentrated iron developer, controlled, but not retarded by methylal, promises to aid the photographer in this direction. We have been favoured by Herr Warnerke with some further details of his continued experiments, which will be read with interest. He says:—

"My further experiments with the iron methylal developer for the wet plates have made it still more a favourite with me.

"I lately observed the fact that in the given quantity of methylal and water, any amount of the protosulphate of iron, or iron and ammonium, can be employed, preserving, nevertheless, perfect freedom from fog in the development.

"Using much stronger solution of iron, and comparing the results with the negatives developed with acetic acid iron developer, the shortening of the exposure secured by the methylal developer became much more striking. I range myself now still more on the side of the first enthusiastic advocates of the new developer. The last formula I used is:—

Sulphate of iron and ammonium	100 grains
Water	1 ounce
Methylal	25 minims

I estimate the shortening of the exposure as two to three."

We shall be glad to hear the results obtained by any other of our readers.

THE VIENNA PHOTOGRAPHIC EXHIBITION.

WE have just received news of the award of medals made by the jury of the Vienna Exhibition. These gentlemen were five in number, and all of them inhabitants of the capital; and their well-known names are a guarantee that the duty devolving upon them has been discharged efficiently and well. Fritz Luckhardt, Victor Angerer, and Carl Haack are names familiar to photographers in this

country, and the two other gentlemen, Julius Gertiuger and Dr. Joseph Szekely, are by no means unknown to many of their brethren in Great Britain.

No gold medals were awarded by the jury; sixteen silver medals, forty-five bronze medals, and thirty-three honourable mentions being included in the Report. We are glad to see the names of Messrs. Robinson and Cherrill among those who have been honoured with a silver medal, the award in this case being made "for combination prints of artistic and technical excellence." Messrs. Robinson and Cherrill, we believe, did not compete for the honour, and it was without their knowledge, indeed, that pictures presented by them a year or two back to the Vienna Photographic Society were included in the Exhibition; the silver medal awarded to them, therefore, will be all the more welcome, as it is unexpected. Messrs. Robinson and Cherrill share with M. Carlos Belvas, a Portuguese amateur, the honour of being the only non-Germans to whom silver medals are awarded. M. Philip Remele, whose diary of travels in Africa we recently published, has been awarded a silver medal "for landscape and architectural subjects taken in the Libyan Desert."

Among the bronze medallists, it is gratifying to see the names of "T. Hedger, photographer at Lytham, England, for studies of animals," and "T. M. Brownrigg, photographer in Dublin, for landscape pictures." Mr. J. J. Woodward, Assistant-Surgeon to the Army Medical Museum, at Washington, also receives a bronze medal for his micro-photographs.

THE COLLODIO-CHLORIDE PROCESS.

BY M. GEYMET.

[WE extract the following from a new work, which has just been published in Paris, by M. Geymet, under the title of "Elements Complets de Photographie." It will be seen that M. Geymet adheres very closely to our own formula, published some years ago in our YEAR-BOOK. The work contains the more recent methods that have been published, and completes the series of volumes which M. Geymet has published relating to different branches of photography.]

The collodio-chloride process, which has never been treated in any manual with all the completeness it merits, will be found exceedingly pleasing by amateurs as a printing method. The possibility of detaching the pellicle of collodion, and to transfer it to any other basis, allows of the most varied applications of the method.

Formula for the emulsion:—

No. 1.—Alcohol	...	100 cub. cents.
Nitrate of silver	...	2 grammes
No. 2.—Alcohol	...	100 cub. cents.
Chloride of strontium	...	2 grammes
No. 3.—Alcohol	...	100 cub. cents.
Citric acid	...	5 grammes

Normal Collodion.

No. 4.—Alcohol	...	100 cub. cents.
Ether	...	100 "
Pyroxiline	...	4 grammes

The first three solutions are filtered when the products are dissolved.

Into 100 cubic centimetres of normal collodion, prepared according to the formula No. 4, there is poured, after previous agitation, 10 cubic centimetres of solution No. 2, and then 10 cubic centimetres of solution No. 3. The emulsion is completed by adding, drop by drop, and vigorously agitating the while, 5 cubic centimetres of No. 1. In this way a milky liquid is obtained, which should be allowed to settle till the morrow.

The limpid portion is then decanted, which is the only part that can be used. This is spread upon alabaster paper prepared as follows with white of baryta:—

Water	...	900 grammes
White of baryta	...	100 "
Gelatine	...	20 "

The gelatine is dissolved first of all in warm water by the aid of a water bath, and the baryta diluted with 100 cubic centimetres of water, and filtered through a bit of linen. A sheet of fine white paper is applied to a glass plate, and the baryta preparation is spread with a brush. The film should be polished with a woollen rag when dry, but both the paper and emulsion may be purchased. The sheet of paper to be coated with collodion is placed upon a thin board that is held in the hand. The borders of the paper are bent up to form a kind of tray, and the emulsion is applied in a regular layer, the support being slightly inclined. Only one application of the emulsion must be made, and the paper may be printed upon as soon as it is dry, or can be preserved in good condition for a month or two.

To whatever use the collodionised paper is put, the toning solution given below ought only to be employed if the pellicle is destined for transferring. No doubt very fine tones may be obtained by the employment of other salts, but these products sometimes coagulate the gelatine, and there is then a great difficulty in detaching the collodion film from the paper:—

Water...	...	...	1000 grammes
Sulphocyanide of ammonium	20	"	
Chloride of gold and sodium	1	gramme.	

Only the precise quantity of bath that is necessary for the toning of a batch of pictures should be used. The printing should be done vigorously, for the pictures become much weaker in the toning bath. At first they appear of a straw colour, but gradually deepen in tint. There is an insufficiency of chloride of gold in the bath if the prints remain a long time stationary, for they should change colour promptly. An excess of chloride of gold in the bath imparts a reddish tint to the print, which is hardly agreeable. In case of need, a sulphocyanide bath may serve for fixing, but it is much better to put the print for four or five minutes in a bath made up of:—

Water...	...	...	1000 grammes
Common salt	...	...	60 "
Hyposulphite of soda	...	...	100 "

The hyposulphite imparts transparency to the blocks and half-tones.

Prints upon collodio-chloride paper are much more delicate than those upon albumenized paper. The reason of this is apparent. The grain of the paper disappears under the film of baryta, which, when properly applied, gives a glazed surface, and the collodion carrying the image is, moreover, much more brilliant than the film of albumen. If required, however, matt prints may be secured, if the collodio-chloride is applied to a non-burnished surface. By printing upon collodion paper the most brilliant whites are obtained, and many of the prints one sees and wonders at at exhibitions are produced upon this paper. People attribute the production of such pictures very often to a special toning process, or to the use of a special albumenized paper, not knowing how else to account for the brilliancy.

The same effects may be obtained by transferring a positive obtained in the camera to porcelain paper, but the operation is a delicate one, and the method, which was worked several years ago, has now been abandoned.

WAX MATCHES.

BY W. A. NICHOLAS, AUSTRALIA.

As nearly all children are photographed in white dresses, and in this colony the faces are often a great deal tanned through exposure to the sun, I have found a useful help in a simple wax match. If I have been unable to get full exposure through the restlessness of the little sitter in dull weather, by lighting a match and holding it just under the face only, so as to make that part of the plate hot during development, it is astonishing the increase of detail I get. As all practical dodges are useful in photography, those inclined to try this will find one match sufficient to heat the plate. There is no danger of the plate cracking through uneven expansion.

THE LAST STEPS OF PROGRESS IN DRY PLATE WORK.

BY DR. H. VOGEL.*

DURING my journey to the East Indies, I several times alluded to the practice of dry plate photography, and now, on my return to Europe, I find the subject attracting universal attention. And no one is likely to deny the importance of the question when I mention that there are photographers like Naja of Venice, who reproduce not hundreds, but thousands, of architectural subjects upon dry collodion plates, and some of these are exposed at times for days together, when necessary. We have made, if slow, at any rate, steady progress, in dry plate work, and one important step is the circumstance that we may now purchase the prepared films in commerce, so that we are spared the tedious and time-taking operation of producing the plates ourselves.

The benefits derived from dry plates by the portrait photographer are of a secondary nature. For these the wet process is of first importance, and it will remain so for a long time yet. Even when it is practicable to produce dry plates which are sensitive enough to be used in the studio—I have myself, on many occasions, employed dry plates in my glass room—still the tone of the film is quite different from that furnished by a wet plate. Very often we see dry plate pictures which appear as beautiful as the wet, but if the same landscapes are taken at the same time on wet and dry plates, the superiority of the wet plates in regard to beauty and harmony is perfectly marvellous.

I have repeatedly, on my last journey, taken views of the same object with wet and dry plates. I employed the Wortley plates with alkaline development, the best and most sensitive I know. I required to give the dry films not much longer exposure than the wet plates, but, despite the difference in the exposure, and very careful development, there remained a difference between the wet and the dry pictures. The dry plates, even when over-exposed, rendered the darker portions too dark (the foliage, for instance, in the foreground), and the lighter parts too light (the sky and the distance), while the wet plates gave the lights and shadows much more clearly, and with far more detail. Such defects as these are serious ones. In any case where it is a question of securing an artistic tone, wet plates will always have the preference. Dry plates, on the other hand, will be preferred where artistic harmony is not of much importance, but where the photographer is beset with difficulties, and for this reason they are invaluable for scientific or technical purposes. Photography has long ago ceased to be pure science, and it is now abundantly used by those little cognisant with the chemical reactions that take place—as, for instance, architects, engineers, naturalists, &c.—and it would be more extensively employed still if it could be further simplified, and if so many easily decomposed liquids—as collodion, pyrogallol acid, fixing solutions, &c.—were not requisite for the work. To such as these it is a great convenience to purchase photographic plates as easily as writing paper.

Professional photographers need be under no apprehension from this spreading of the photographic art, for the cultivation of music by the masses furnishes a parallel example. In no other country are there so many musical amateurs as in Germany, and yet in no other land are there so many professional musicians, nor are they so well off.

As far as I am personally concerned, I do not like the preparation of dry plates, and for this reason I prefer to purchase them; had I to prepare them myself, I should prefer to work only by the wet process.

A grave drawback to dry plates is their perishable nature; despite the careful packing, the English dry plates sent over here are generally spoilt to the extent of

* *Photographische Notizen.*

two per cent., and when it is borne in mind that a further percentage of negatives are broken, the loss, of course, becomes higher. It must therefore be regarded as a great advance in dry plate photography that paper has again superseded glass as a basis for the dry film. The inventor of this new dry process without glass is an Austrian, who lives in England, M. Warnerke, and if we are to believe the good news he tells us, dry plate photography will make a giant stride, indeed. M. Warnerke does not prepare a calotype paper as of old, but he covers a glazed paper with alternate layers of leather-collodion, made up of—

Pyroxilin	...	...	...	2 parts
Alcohol	...	...	...	50 "
Ether	...	...	...	50 "
Castor oil	...	...	...	1 part,

and of India-rubber solution prepared by dissolving one part by weight of rubber in a hundred parts of benzole. The paper prepared in this way is then coated with the dry plate collodion. The operations of sensitizing and washing the film cannot, of course, be undertaken under the circumstances, and to obviate them, a collodion is employed which does not require sensitizing, a so-called emulsion, which is ready for exposure as soon as dry. M. Warnerke recommends that a good bromide collodion be poured into a saucer and allowed to dry in the form of a thick film. Into the saucer, or dish, is then put the silver sensitizing bath, which is allowed to act upon the film thoroughly; the film is then washed, and this, containing bromide of silver, may be peeled off and dried. Finally, it is dissolved again in ether and alcohol, and yields the finest emulsion, which it is merely necessary to apply to the prepared paper, when a sensitive dry film is the result. The prepared film upon paper is cut to any size that may be desirable for exposure in the dark slide, and is pressed against glass when in position to keep it flat, and even while the development is undertaken, after the dry film has been removed from the paper. The negatives obtained in this way are thick films, which do not require to be varnished, which may be printed from either side. A very pretty arrangement which M. Warnerke has devised, is to have a dark slide with a provision of paper film, so that a series of plates can be taken one after another. No changing boxes are necessary in this arrangement, but only two rollers, which are fitted on each side of the slide. Upon one of them the sensitive paper is rolled up, the end being attached to the other roller, and the film is rolled on to one and off the other, as one exposure follows another. In this way a whole series of negatives may be taken without once changing the slide. The communication of M. Warnerke contains so much that is new, that all who are interested in dry plate photography should repeat his experiments. It may turn out that in practice matters do not go so easily as may appear from the author's memoir, but it is very certain that the path he has pointed out is the right one to follow.

NOTES ON PHOTOMETRY.

BY D. WINSTANLEY, F.R.A.S.

THE necessity for quantitative photography is becoming felt more and more almost every day. In these circumstances a brief resumé of the facts ascertained by Busen and Roscoe, and bearing on the question, will be of value to intending experimentalists. The following remarks consist of notes which I have condensed from an elaborate paper by the gentlemen in question, a paper which appears in the 153rd volume of the "Philosophical Transactions."

In the first place "it was found that very slight differences in the degree of shade could be detected so long as the tints are light coloured; but that when deeper tints are employed, the eye loses the power of estimating such differences."

"The shade produced upon photographic paper is not proportional to the intensity of the incident light."

"Equal products of the intensity of the light into the time of isolation correspond within very wide limits to equal shades of darkness produced on chloride of silver paper of uniform sensitiveness."

A solution of chemically pure silver nitrate is used as the silvering liquid.

"The pure chloride of sodium required for obtaining a film of chloride of silver was prepared by passing gaseous hydrochloric acid into a concentrated solution of common salt, washing the precipitated chloride of sodium with water, and heating it strongly in a platinum basin."

A series of experiments were made "for the purpose of determining the influence exerted on the sensitiveness of the paper by the concentration of the solution of salt," by which it was found that "the sensitiveness of the paper increases rapidly with increasing strength of the chloride of sodium solution, and that, so far as the observations extend, no limit exists beyond which an increase or a diminution of the percentage of salt in solution ceases to affect the sensitiveness of the film."

"In order to obtain constant results, it is, therefore, necessary to employ a solution of chloride of sodium of unvarying strength."

A solution containing three per cent. of sodium chloride was fixed on as the standard solution to be employed.

"Such a solution is especially convenient, because the paper dipped in it removes salt and water almost exactly in the proportions in which they are contained in solution."

"It is possible to impregnate five square metres of paper with a solution containing sixty grammes of chloride of sodium without any danger of reducing the strength of the salt solution below the point at which differences begin to appear."

"In order to obtain a homogeneous sensitive film of chloride of silver, the paper must not be laid upon, but immersed in, the chloride of sodium solution."

"The sensitiveness of the paper remains unaltered when the concentration of the silver solution varies from eight to ten or twelve parts of nitrate of silver in one hundred of water."

"The time during which the paper lies on the surface of the silver bath can vary from fifteen seconds to eight minutes without any difference in the sensitiveness of the paper being noticeable."

"Two-thirds of a solution containing twelve of nitrate of silver in one hundred of water may be used up before the quantity of silver salt sinks from twelve to eight."

"The occurrence of nitrate of soda produces no effect upon the sensitiveness of the paper."

A piece of thick white paper should be held behind the tinted papers whilst reading off.

"The variation in the thickness of white paper such as is usually employed for photographic purposes is without influence upon the sensitiveness of the film of chloride of silver."

"The ordinary changes of atmospheric temperature and moisture do not affect the sensitiveness of the paper."

In preparing the standard paper, the sheets are immersed in the salt solution for five minutes. "The salted paper can be preserved for months without being in any way injured."

"Each piece of paper is allowed to lie upon the surface of the silver bath for two minutes."

"The standard paper thus prepared can be preserved in the dark after drying in the air for from fifteen to twenty-four hours without undergoing any appreciable change in its sensitiveness," and "possesses a degree of sensitiveness sufficiently constant for all the purposes of our measurements."

Experiment showed that the tint obtained by mixing one part of chemically pure lampblack with one thousand parts of chemically pure zinc oxide "is that about which

the eye can distinguish between very slight alterations of shade, but that these slight alterations cannot be observed when the tint is either darker or lighter." The mixture containing one thousand parts of zinc oxide to one part of lampblack was, therefore, adopted as the standard tint. "In order that the colour may adhere to the paper, it is mixed with water containing one per cent. of isinglass." "In order to obtain a perfectly constant colour, the mixture must be well ground on a glass plate with water for an hour, then dried in the water bath, and this operation repeated until no difference in shade can be detected between the mixture in various stages on examination in the usual manner upon a fixed strip." By these means "the colour used as the measure of the standard tint can at any time be prepared of a constant and unalterable shade." As the unit of measurement our authors adopt "that intensity of the light which in one second of time produces the standard tint of blackness upon the standard paper."

Many forms of instrument have been devised for producing the graduated strip or scale of tints. The present writer has recently added one other to their number. The gradation obtained thereby is equable, and the instrument itself portable.

MECHANICAL APPLIANCES FOR GOVERNING LIGHT.

BY C. E. MYERS.*

IN the absence of other reliable information, this paper will mainly be confined to such matters relative to the subject as are already on photographic record in our various journals, and for motives of general interest this selection will be made for the most part among such contrivances as have been in some way illustrated.

Obviously the light itself is of the greatest importance. By this term "light," is not meant simply the form of skylight, but the light itself. The main thing is to get enough of it, of good quality, and from one general direction; these matters have in general been settled, and as convenient methods of admitting light two quite distinct styles of openings have sought favour. The practically successful opening is the usual north top and side light. The theoretically perfect style is the so-called "tunnel light," the principle of which is to light the subject and not the camera. Most of the lights in use are such modifications of these two designs as the varying construction of the edifice, or faith, or whim of the artist make expedient.

The cry for "more light" having been considered, the next thing is what to do with it; and at this point it is discovered that light, like "fire, is a good servant, but a bad master." In other words, light is obstreperous, and various contrivances, consisting of curtains, shutters, shades, blinds, screens, and reflectors, ingeniously tangled with cords, pulleys, poles, and balancing weights, are brought into requisition. Passing to those used inside the room, the ordinary window-curtain sliding on rings and wires has first received attention, and for a side-light screen this still continues among the best, as cheap and easily adjusted in sections to cover the whole or part. Next comes the rolling shade, the better form of which is the "spring shade," excellent for top-lights, as they take up little room, and adjust to any position. The ordinary sliding shutters are effective, but much too cumbersome and expensive for general use, or on large lights. One style of swinging curtains is much to be recommended by reason of its cheapness and efficiency, the only objection being that when thrown open, or not in use, the amount of light is considerably less than that of an open light. This style is formed of both frames covered with cloth, and suspended by screw-eye hinges from the rails of the skylight; they

are then connected in gangs or sections and swung by cords.

These three or four methods, or their modifications, comprise all the styles that have proved either cheap, practicable, or convenient appliances, not movable about the room; and these have also been mounted on portable frames and used near the sitter.

Among the portable contrivances for modifying the light by reflection, the first receiving much public attention was Kurtz's "Patent Rembrandt Counter Reflector," exhibited at the Cleveland Convention. It consists of an open frame, nearly square, on wheels, and having a reflector hinged to the interior of its four sides. On each outer side of the frame is hinged a frame containing a tilting reflector, the intention being to reflect light variously on the subject.

Next comes Adam-Salomon's "Alcove Background" and system of lighting. It consists of a recess background eight by ten feet, with one or more swinging screens hinged to its top, and controlled by cords, to cut off top-light. It also has ring screens attached to each side. The entire alcove rests on castors, so as to be movable under the light. This is one of the early forms of skylight, or tents within a skylight, to which the usual curtains or screens are attached.

Next comes Kent's hand-screen, with which I suppose you are all familiar. It consists of a square framework covered with tissue-paper or cloth, and is wielded by a long stick in the hand of the operator. There is no doubt about its efficacy.

Among others, Mr. I. B. Webster takes decided grounds against the screen, because it has to be held in the hand or moved during exposure, and, adducing twenty-five years' practice against theory, says, "The more quiet the room is during the sitting proper, the more perfect and satisfactory the expression;" and he claims, very properly, that the principle of the movable screen is not patentable, but common property, though any particular or original pattern of construction may be patentable, leaving it with the fraternity to buy such pattern or not, or to construct and use any other different pattern. He proposes, as the proper method of introducing any good pattern, to manufacture it and place it on sale at a moderate price, instancing Bigelow's background as being well contrasted with the idea of a speculator who invests in a patent-right for a plough, very good in its way, and who then claims to cover the system of ploughing, and that the honest farmer must either buy his right or quit ploughing.

Among the various novelties brought to light by the misunderstanding of Mr. Kent's position is Mr. Manville's. This is so similar to Mr. Kurtz's counter reflector that I may use the same model to illustrate it. It differs mainly in having a screen like Mr. Kent's attached by a bolt to a bar across the middle framework. It was adjusted in position by a brace attached by screw-eyes. It could be raised or lowered in the frame, and had a motion through the arc of a circle in two frames substantially at right angles to each other, and the screen itself could revolve about the end of its supporting bar. In fact, it was a screen with a restricted universal motion, and was only faulty in being cumbersome.

In the same number is Mr. B. F. Hall's illustration and description of a universal screen in use by him over two years. It is made of printing paper pasted over a wire hoop, to which is attached a small tin pipe, fitting snugly upon the end of a jointed bar, the other end of which stands in an ordinary head-rest column. The joint is made fast by a thumbscrew. The arrangement can be illustrated by a palmleaf fan jointed by the end of its handle to an upright shaft. The arrangement makes a universal joint by which any angle can be given and retained in the screen end. Up to this date nothing better has been described in any photographic publication.

(To be continued.)

* Read before the N. Y. A., America.

Correspondence.

HOW TO OBTAIN RESULTS LIKE THE LAMBERTYPE.

MY DEAR SIR,—There appears to be a great deal of speculation, uncertainty, and vexation concerning the validity of M. Lambert's patent, and I purpose, with your kind permission, to describe a very simple method of producing effects and results similar to those obtained by M. Lambert's process without infringing or hazarding the infringement of the patent rights in the slightest degree. The process I am about to describe is not a recent conception. I have used it for strengthening weak negatives for some time past, and have shown it to friends when visiting my studio. It is one of many ways of helping a lame dog over the stile, and enabling me to make a passable print from a miserably thin negative, such as is generally obtained from children and animals on account of under-exposure.

There are two ways of doing it. The first and most mechanical is to apply a strengthening plaster to the back of a weak negative in the following manner:—Take a collodion transparency or a paper print from the weak negative, fix, wash, and dry it. From that take another print, which will be a negative, fix and wash it in boiling water, and, while wet, apply it to the back of the negative; adjust it carefully, and with the finger press out all air and water, so as to secure absolute contact. When dry, make it transparent by smearing with castor oil, or by removing the paper by wetting and rubbing. The latter plan is the best, but it involves most trouble.

The second method is the more artistic one, and mostly resembles M. Lambert's process, and is as follows:—Fix in hypo, without exposing, a piece of sensitized albumenized paper, wash it in boiling water, and lay it on the back of the negative while wet; secure absolute contact by rubbing with the finger or squeegee; when dry, rub off the paper, leaving the unbroken and undisturbed film of albumen on the glass. This has a ground-glass appearance, and a stronger tooth than ground-glass varnish, and can be worked upon with plumbago and a stump, so as to increase density and heighten effects. Attach to the front a piece of tracing or thin paper on which to do the sharp retouching, spotting, &c.

Infringement of M. Lambert's patent is thus avoided, for there is an albumen film on one side and a paper screen on the other, on which the same artistic effects can be produced by working on both sides of the negative.

Now that I have described a method of avoiding all the pains and penalties of patent right infringement, I hope that your discontented readers will rest satisfied, and make the most they can of a process obtained without cost. At the same time I think it is but fair towards M. Lambert to state that it is utterly impossible for me to impart a tithe of the dexterity and ingenuity which that gentleman exhibits in his manipulations. I have seen M. Lambert at work a whole day and more, and I do not hesitate to say that it was absolutely impossible for him to cooer in any specification the real strength of his process. The placing of the papers at the back and front of his negatives is only a step towards the accomplishment of objects desired, and the finished results obtained by that and the following operations are not, I believe, to be obtained in any other way.

The real value of M. Lambert's patent lies not in his specification, but in the quick and certain manner in which he imparts to his licensees, the sure and never failing method of securing the most satisfactory results in the shortest possible time, and with the minimum expenditure of material.

The certainty with which he reproduces and improves negatives is surprising, and the acquirement of that information alone, to say nothing of the numerous other technical instructions included in his demonstrations, is well worth the money he asks for a license which enables and empowers

a licensee to practise with certainty, and without molestation, the Lambertype, the Chromotype, and all the operations of Autotype or carbon printing.

It is scarcely possible for any man to have a greater contempt for *petite patentees* than I have, but when a stranger who has valuable information to impart, and dexterity of manipulation to exhibit, whether protected by the patent laws or not, comes amongst us, I think he should be received with courtesy and consideration. Knowing that M. Lambert's process and instructions will be valuable to every photographer, I wish him well, and many followers.—I remain, yours, &c. J. WEGGS.

[P.S.—Enclosed are prints from same negative before and after being invigorated by a strengthening plaster.—11a, Berners Street, July 31st. J. W.]

THE LAMBERTYPE PATENT.

SIR,—That my knowledge of Patent law may not be so extensive as that of Mons. Lambert, I am quite ready to admit, but that any blunder was made in saying what I did thereon, I distinctly deny. The error lies with Mons. Lambert taking it for granted that any and every legal point mentioned had direct application to the Patent No. 1634 A.D. 1874. Mons. Lambert will pardon me pointing out his error.

The controversy has been brought to a focus much sooner than I had anticipated. Mons. Lambert, in his specification, says, "What I claim . . . is the method of applying a semi-translucid sheet on each side of a negative or positive, and of quickly and readily retouching by operating on these surfaces." This may mean the "method" or the application: however, as the specification does not describe the "method," it must mean the application. As this has been employed before, he now drops the claim to a "semi-translucid sheet," and falls back upon the retouching of the two said surfaces. I know you may describe a thousand old things in a specification, and also know you must not claim one; for instance, I might describe the crank motion, and apply such motion in an invention in a perfectly valid manner; but were I to claim the crank motion, and such claim be allowed, I could stop nearly every engine in the country. The difference between describing and claiming is well and very justly provided for in English Patent law. However, leaving Mons. Lambert to get out of this difficulty as he likes, let me take his version; viz., "we use the two sheets as simple vehicles for retouching." Now, my imperfect knowledge of patent law will allow me to say this much. If Mr. Croughton had used paper on both sides, but simply retouched on one—say the back—and others had used paper on both sides, but retouched only on the front, such would not invalidate Mons. Lambert's claim to the use of both surfaces conjointly for retouching (assuming that to be his claim). Yet if it can be clearly shown that the use conjointly of both surfaces for retouching upon with the aid of stump, powders, &c., has been generally used in the past, such would invalidate any claim for the same thing if made at a subsequent date. I know those who have, and do still, retouch on both sides, having been taught, not as a secret, and they can show where it was and is in constant practice, and that at a date prior to May 8th, 1874.

The absurdity of the challenge is obvious. "Messrs. Fry, Batho, Brothers, and Slingsby" would be foolish, indeed, were they to accept it as it is worded, because they would be bound to produce so-called chromotypes, as Mons. Lambert includes "all the different results" obtained by his patented "processes," and ties the aforesaid to Croughton's alone. Probably Mons. Lambert is a clever manipulator, but skilful use does not establish the right to any materials; hence any test where parties would use exactly the same agents could but be a test of their skill, and would fail as a test of the validity of a patent; indeed, it has nothing to do with it. Assuming I took up

he effects desired. I saw his negative so treated, and so did thirty or forty others. I adopted it at once, and com- his challenge, I should use exactly the same agents as him- self, and thus his boasted test would be one merely of skill, not having any connection with the validity of his patent, which can only be decided by the Court of Chancery. The profession are well aware of this, and know what value to put on a challenge that bears some similarity to that of the man who owed a shilling, and offered to test liability by a fight.

"An amateur" offers some remarks, likening myself, along with others, to timid schoolboys. I can only account for "Amateur's" simplicity in two ways: first, that he is a barrister; and, second, a foreigner, and unacquainted with our laws. That he is a barrister, and advocates his suggested course, having in view retainers, refreshers, &c.; that he is a foreigner, and does not know that victory in our courts, oftener than otherwise, is as costly to the victor as to the vanquished. The knowledge of this is the cause of many acts of injustice being submitted to.

An Amateur, who, I assume, has been delegated to write "in the interest" of all amateurs in our planetary system, should read the "History of the Bromide Patent in America."

What is Mr. Slingsby's "conspiracy fund," which Mons. Lambert declares is illegal? Do satisfy my curiosity, if you can, Mr. Editor, as I never heard, nor can I imagine, what an "illegal fund" is; but in legal matters I must hold my peace, for here comes "Sir Oracle, and while he speaks, let no dog bark."

Halifax, July 31.

W. E. BATHO.

DEAR SIR,—For two reasons I did not wish to be drawn into the discussion about the Lambertype patent: 1st, my business engagements take up so much of my time that I have none to spare for such a purpose; 2nd, having published enough to prove, to any disinterested person, that I was before M. Lambert in the use of transparent paper upon both sides of the negative for the purpose of retouching and improving, I did not think it necessary to repeat it. But after the attacks made upon myself, and what M. Lambert pretends to believe is my method, in last week's News, my silence would be open to misconstruction if I did not answer it. I must, therefore, ask you to allow me space to vindicate myself once and for all, as I have neither time nor inclination to be drawn into a long discussion upon it.

M. Lambert puts his specification by the side of a paragraph from a long paper read by me before the South London Photographic Society upon enlargements v. large direct pictures. This statement was made among others at the close of the paper, which was intended for discussion, and all the members who were present will doubtless remember that during that discussion I described how I could improve the resulting print by working with the finger and a small tuft of cotton-wool upon both sides, using, not galvano-plastic powder (for in all my communications I prefer to use plain English), but soft crayon mixture, with and without the mixture of cuttle-fish powder, to get an even distribution of the colour, and showed negatives done in that way in illustration. This, then, is the whole sum and substance of the process patented by M. Lambert.

But I can go further. In November, 1873, many photographers who came up to the exhibition of the Photographic Society came to me for lessons in retouching, and other branches of photography. To all who came for lessons in retouching I showed the advantage of the use of tracing paper upon both sides of the negative as a medium for retouching, and in spite of M. Lambert's tribute to my talents, he must have very little opinion of them if he thinks I could have used tracing-paper upon the front and back without finding out the facility with which effects could be obtained upon them with both stump and points. If M. Lambert really wishes to be convinced, so as to give up to the profession gracefully what is clearly their right, I can give him the names of photographers who saw the negatives

at my studio as early as September, 1873, and the name of one gentleman who came for hints in enlarging who was shown the method which he (M. Lambert) has patented so recently. I should think this should settle, once and for all, my right to claim priority of invention.

M. Lambert must be as imperfectly acquainted with the English character as he says he is of the English language, if he thinks he can make attacks upon gentlemen of known reputation, such as Messrs. Slingsby, Fry, Brothers, &c., without damaging his own cause. He accuses these gentlemen and myself of a conspiracy. He may, perhaps, be sorry for his ill-advised letter when I tell him that but for the attack made upon me in it, I was quite content to let things rest. If photographers like, after all that has been published about it, to pay M. Lambert £20 for instructing them in a process which has been freely given them, let them; it is not the first time it has been done, nor will it be the last; and my writing for the photographic profession has (and, I suppose, will always) entail upon me much work and little thanks. The gentlemen he names (with the exception of Mr. Fry) have written entirely upon their own responsibility, without consulting or even writing to me upon the subject. To Mr. Fry I gave my reasons for not wishing to go into the matter, and they had his hearty sympathy, as he, in common with many others who give their experience through the pages of the photographic journals, has had the same experience as I have of what it entails. I have had to write dozens of private letters upon different subjects I have written about, and have rarely had a letter of thanks, or even acknowledgement of the receipt of the information asked for. I had, therefore, decided upon keeping out of a discussion for which I had little inclination and less time, and should have done so but for M. Lambert's direct attack.

As for the challenge contained in M. Lambert's letter, it is almost too absurd to be noticed. If I had been selling a rival patent it might be worth my while; but to leave my business, disappoint my clients, and spend money, for the sake of giving £50 to some charity which is to be chosen by the Photographic Society, is very reasonable! I should lose as much in time and expense as the amount staked; and even if I win or lose, I only demonstrate the value of a process which I was the first to publish. The last result would be entirely due to the man, not the process.

I must apologize for taking up so much of your space, but I wish to settle the matter once and for all. With the evidence I can and have produced, there can be no doubt that the Lambertype Patent is invalid, and, whatever others may do, I do not intend to give up using a process I have used, and published in 1873, for a patent taken out more than twelve months after.

Of the Chromotype process I know nothing; but the Lambertype I distinctly claim as my own by priority of invention and publication.—Yours truly, G. CROUGHTON.

Lowestoft, August 2nd.

SIR,—I had hoped I should not have occasion to write again on the Lambertype, but the letter in your last, of almost unprecedented length, from M. Lambert, demands just a few final words.

The proposal to stake or wager £50 I attribute to the complete unacquaintance of M. Lambert with English practice in such matters. Personally, I never enter into any such engagements.

I saw just what his pupils saw, and watched the operation with them, and the next day performed the entire operation, complete to the carbon print, at the first attempt. The carbon I relinquished for the simple reason that silver prints are better; this I regret. With regard to the Lambertype enlargement, having since last week met the member of the South London Society before whom Mr. Croughton's paper was read, I find no lack of the strongest evidence that Mr. Croughton did paper both sides of the negatives, and did work both sides as required, to produce

municated it to Mr. Slingsby, who brought it into large commercial use for his Vanderweyde pictures. Since seeing M. Lambert's work, and fully inspecting his enlarged negatives, no change has been made in my working, for the simple reason that I have at command already, in complete working order, just what I want, and all he has to sell; but if any one prefers to pay £20 for the right to M. Lambert, there is nothing to prevent it.—I am respectfully,

SAMUEL FRY.

ON THE PRESENT POSITION OF OPERATORS, ETC.

SIR.—When writing on this subject last week, it occurred to me that there would be considerable difficulty in getting a recognised board of examiners.

I am occupied from morning till night, and have not much time even for reflection; I am, therefore, not in a position to write much on the subject. Would it not be possible for each of the principal photographic societies to elect one gentleman, the gentleman elected by the Photographic Society to be president of the board? This would neutralize any feelings of jealousy that might exist. These gentlemen could draw up a proper circular, with their names, and the purpose contemplated. A copy of this might be sent to every photographer in the United Kingdom employing assistants, asking them to recognise the board by signing and returning the circular. The names could be published both in the *News* and *British Journal*. Having got the signatures of the leading photographers, the principal difficulty would be surmounted. The great "stumbling block" to any united movement among photographers appears to me to be the almost total want of unity among them.—Yours, &c.,

AN OLD PHOTOGRAPHER.

Talk in the Studio.

PERMANENT SENSITIZED PAPER.—In the course of the discussion on the uses of uranium, we received from Mr. Werge, in the month of May, some unfixed prints in illustration of the points raised. Incidentally Mr. Werge mentioned that the prints were unfixed, and on his durable sensitive paper. They have remained simply folded in a piece of note paper and an envelope on our desk for about eleven weeks, and on examining them we find no more discolouration than we should find on keeping ordinary sensitized paper one or two summer days, and not more than we frequently find to disappear entirely in the hypo bath. This is a severe test satisfactorily met.

MR. HARE'S NEW CHANGING BOX.—We have recently had an opportunity of inspecting the new changing-box invented by Mr. Hare, which is singularly ingenious and efficient. As a general rule we have found the old form of changing clumsy and troublesome, easily getting out of order, and easily permitting mistakes to be made in changing. The new box is an improvement in all these respects. It is light and compact, so that a considerable saving in weight and bulk is effected as compared with carrying double backs. It is to a considerable extent automatic in action, so that risk of injuring the plate, or risk of error or re-exposing, is scarcely possible. Altogether, this is a great improvement on the old form of changing-box.

THE VANDERWEYDE STUDIO.—Our notice of the new system of lighting which Mr. Vanderweyde has patented must be delayed for a week or two, as the arrangements are not yet complete. Before definitely calling public attention to his system, Mr. Vanderweyde is anxious to arrange facilities to offer a comparative test of the working in an ordinary studio under precisely the same conditions as his new method. His announcement will be found in our advertising columns.

A REVOLVING STUDIO.—Mr. T. W. Dodge, of Guisborough, writes to say that he has constructed a studio which is made, by means of a turn-table, to secure any aspect of lighting. A revolving studio is an ingenious idea, and has been proposed before; it has nothing in common, however, with the system of Mr. Vanderweyde.

To Correspondents.

HENRY SPINK.—We have not seen the Japan ink of which you speak, but we have no doubt that it can be obtained of some artists' colourman in London, such as Newman, Winsor and Newton, Rowney, or Reeves.

A SUBSCRIBER.—Your negative is defective every way, being fogged and imperfectly defined. The granular texture, which is very apparent under a moderately powerful lens, may be due to some imperfection in the pyroxylene, or the use of imperfectly rectified alcohol. The manufacture of collodion is very interesting as an experiment; but to undertake it with any hope of success, it should be done with materials of known purity and in proper condition, obtained from a trustworthy photographic chemist.

ISLAND.—There is not any danger to the permanency of a print on removing portions by means of cyanide of potassium, provided you wash the print carefully afterwards to remove the cyanide. 2. The pink tint in some Eburneum prints sometimes appears at the time of toning, and sometimes not until after the image has been exposed to the light. It is due, we believe, to imperfect washing after toning, the pink tint being due to a reduction of the gold toning solution. There is no way of removing the tint, so far as we know. 3. For such a subject as that you mention, containing such excessive contrasts, we should use a strong iron developer—say forty grains of protosulphate of iron, twenty minims of acetic acid, and one ounce of water.

R. A.—We are uncertain of the precise angle, but we believe that, without being what is called a wide-angle lens, it includes a good angle. We have not had any personal experience with the lens, but have heard good reports.

GEORGE DOWNS thinks that the publication of Mr. Croughton's paper forestalls the Lambert patent, and objects to the supposition that, in any case, the silver printing process is in danger. He says:—"Why is 'silver printing' to be a thing of the past, so far as the influence of the Lambert process goes? What is there to hinder taking silver prints on albumenized paper from a Lambert negative; or, if plain paper is desired, using the old ammonio-nitrate process? If prints in carbon are wished, why cannot they be produced by any one on the materials supplied by Messrs. Spencer as heretofore? And if enamelled prints are required, they can, I presume, still continue to be produced without any reference to M. Lambert."

W. R. P. JEFFERY cordially endorses the letter of "An Amateur" in our last, deprecating the waste of space in our pages devoted to discussing a question which can only be settled in a court of law.

L. W. W. will find in various of our YEAR-BOOKS, especially those for 1863, 1864, and 1865, many details on glass houses and their construction, as well as many articles in the *News* descriptive of different studios. Much information and many hints may be obtained by searching through our back volumes, but we cannot undertake to say which is the best mode of building a studio.

T. T.—The qualities which cause a collodion to give intensity are produced by the combination of many causes, not by one alone. Intensity depends somewhat upon the quality and quantity of the gun-cotton, as a full quantity as can be used without making the collodion too thick tends to produce intensity. The quantity and character of the sensitizing salts, and the time the collodion has been iodized, also affect the question. As a rule, iodide of potassium tends to intensity, and ripeness in the collodion tends to intensity. But the strength of the silver bath, the character of the light, the focus of the lens, and the character of the developer, all have a material effect on intensity. It is probable that you will be able to obtain Anthony's cotton of Mr. Atkinson, of Liverpool.

B. D. L.—The use of central stops in portrait lenses was not common in the early days of photography, hence most of the old-fashioned portrait lenses were intended for use with their fullest aperture. That aperture was not always, however, of the full size of the lenses, as, if you examine, you will find in many there is a fixed aperture, much smaller than the lens, immediately behind the front lens of the combination. The best place for a stop is determined by the foci of the lenses of the combination. Thus, if the front lens have a focus of six inches, and the back lens a focus of twelve inches, and the amount of separation be three inches, the stop should be placed at a distance from each in direct proportion to their respective foci, that is, two inches in advance of the back lens and one inch behind the front lens. In this position distortion is corrected, and the maximum of advantages gained. If the object be to flatten the field for copying purposes you may place the stop nearer the front lens.

F. G.—A plain paper print for an occasional purpose may be obtained by using the plain side of albumenized paper. We have obtained very good results so; but of course they are not equal to the results which may be obtained on carefully prepared plain paper.

J. H. S.—The difficulty you describe is very curious. We presume that the new collodion which declines to mix with the emulsion must have been made with other material and in other proportions than that used in preparing the emulsions. Possibly the addition of more ether, and constant agitation, may meet the case. It is possible that you have used an unsuitable example of pyroxylene, which yields a very glutinous solution, and in this case the mixture with a somewhat powdery emulsion would be difficult.

Several Correspondents in our next.

The Photographic News, August 13, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

AN ELECTROGRAPH—PHOTOGRAPHIC EXHIBITIONS ON THE CONTINENT—NEW BOOKS.

An Electrograph.—We do not think many of our readers know what an electrograph is, and if we told them it was a scene from nature, impressed in its natural colours upon a sheep's back, they would be little the wiser, probably. This, however, is what an electrograph appears to be, if we may judge from paragraphs which have recently appeared in the *Pictorial World* and in *Figaro*. At present, perhaps, it is too much to say that the electrograph in question is really a *bona fide* affair, for Sir William Thompson, the well-known electrician, to whom the circumstances have been related, is somewhat sceptical in believing the accounts which have been given him, and refuses to hold it possible that a sheep's skin is capable of retaining an impression reflected upon it by electric light. The circumstances of the case appear to be these. During a thunderstorm in the Midland counties, a little while ago, a great many cattle and sheep were struck by lightning, and a lamb which had taken shelter under an oak shared this fate. What was the astonishment of the rustics, when they came to examine this lamb, to find a picture of the tree, sky, and meadow outlined upon its fleece. Even the hedge-row dividing the fields was to be seen, as also a group of huddled sheep, which were not, however, very sharply defined. This marvellous picture was impressed upon the lamb's wool, it is said, by the vivid lightning that killed the animal, and we are asked to believe that an electrograph can be produced in this simple manner. The *Pictorial World*, notwithstanding Sir William Thompson's disbelief—it is fair to say that Sir William has not examined the skin, but has only heard a description of it—thinks the circumstance by no means incredible; while a correspondent, "E. G., of Kidderminster," of *Figaro*, whom the editor of that journal describes as "thoroughly trustworthy," brings up a great deal of evidence of a personal character. "E. G." says "that he saw the skin when only partially dressed, and holding it up to the light, the picture of the tree could be seen in its natural colours." After this, who can say that photography in natural colours has not been discovered, especially when "E. G." goes on to declare further that the tree had "brown trunk and branches, and green oak-leaves." We fancy it was the latter that effectually decided Sir William Thompson. No one would have objected to a brown photograph, but green oak-leaves are things which no photographer would readily accede to. "E. G." continues, that the tree "was clearly outlined against the sky;" but he admits that "the hedgerow and the group of huddled sheep were somewhat less distinct." Sir William Thompson believes—and we cannot help thinking that his solution is the correct one—that the natural markings on a sheep's back, which are frequently of a fantastic character, have been mistaken for twigs and branches of a tree by the imaginative observer; and we have no doubt that the green observed while dressing the skin could be easily accounted for in the same way by an experienced butcher. We are glad to hear from "E. G." that "this curious electrograph has been carefully preserved," for some of our friends in the neighbourhood may, perhaps, favour us with an opinion after an inspection of the marvellous production. That the electric fluid may have burnt the skin in some places, and in this way impressed the back of the lamb, is not improbable; but that the skin should contain elements which permit of the fixing of natural colours, is a matter which few photographic chemists would believe. The matter, however, is certainly sufficiently curious to deserve investigation by a scientific man; and as we are assured that the skin "has been carefully preserved," we hope

some correspondent in the neighbourhood of Kidderminster will take an opportunity of inspecting the "electrograph," and will give us his opinion on it. Strange to say, the three soldiers who were struck by lightning on Saturday last, while taking shelter under a tree on Woolwich Common, are reported to have pictures of trees impressed on their flesh. The twig-like formations are no doubt due to the spreading of the electric fluid.

Photographic Exhibitions on the Continent.—Both in Brussels and at Vienna there are exhibitions of photographs to be seen just now, the gatherings in each case being under the patronage of royalty. At the Brussels Exhibition the medals have not yet been awarded, but we are informed that besides a *medaille d'excellence*, which is to be given to the best work in the room, there are to be seven other medals awarded, viz., for heliographic engraving, heliotype, Woodburytype, or similar processes; photo-lithography, carbon photography, silver printing, and photography upon glass or porcelain. The jury for making the awards will not be composed entirely of members of the Belgian Photographic Association, but will include among the eleven five foreigners, so that there can be no complaint of partiality. A lottery will take place at the end of the exhibition, on the 15th of September, and all works chosen by the winners out of the collection will be paid for by the association. In this way it is hoped that a large number of the best pictures will be sold. The Vienna Exhibition, which is drawing to a close, seems to have been very successful, although the number of foreign exhibitors was limited. As we stated last week, as many as sixteen silver medals and forty-five bronze ones were awarded, all the British exhibitors, we believe, securing one of these awards. The Vienna Society is fortunate in possessing in the person of M. Fritz Luckhardt a very energetic and popular secretary, and to him much of the success of the affair is due. Besides these exhibitions, there are at Paris just now two others, one of Maritime and Fluvial Industry in the Champs Elysées, and the other that of the Geographical Society of Paris at the Tuileries. To both of these exhibitions photographs have been admitted in large numbers, for the art serves as a capital means of illustrating many subjects of peculiar interest in both these departments of industry and science. In the Maritime Exhibition there is a gallery set apart entirely for photographs, and among the pictures may be seen some from the best studios of France. Mr. Robert Crawshaw's well-known salmon pictures find a place in this collection.

New Books.—Two works on photography have just appeared in French, the one by M. Geymet, the other by Dr. Van Monckhoven. That from the pen of M. Geymet is entitled, "*Éléments Complètes de Photographie*," and of this we gave an extract in our impression of last week. M. Geymet's works are well known in France, and are among the best text-books that have appeared in the French language, his last work, which is a supplementary one, bringing up one's knowledge of the subject to the present day, and including details of all the more modern processes. Dr. Van Monckhoven, who is also well known in photographic literature, has published a book this time solely upon the carbon process, being of opinion that this section of photographic art has become sufficiently important of late to be treated in a volume by itself. His work is entitled, "*Historique de la Photographie au Charbon*." Printing in pigments on the Continent lost a warm advocate when M. Marion died, and it requires new friends to advocate its advantages. Unfortunately for our brethren abroad, it is difficult for them to obtain the various kinds of pigment tissue, such as can be readily purchased, both sensitive and insensitive, in this country. Dr. Van Monckhoven's new book will doubtless aid in spreading more widely a knowledge of the art of printing in permanent pigments throughout France and Belgium.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XIII.

THE PHOTOGRAPHERS' TOOLS—COPYING.

IN the choice of cameras, lenses, headrests and other requisites of the photographer, the best are always the cheapest. To buy a lens because it is *cheap* is a great mistake, and sure in the end to lead to needless expense and annoyance.

The Camera.—The body of the camera should be of the best quality procurable, and it will outlast two or three of inferior make, besides being free from the defects of construction, which are a source of anxiety and failure.

A swing back, both vertical and horizontal, should be one of its features; as also a sliding carriage for the plate-holder. The rigid and obstinate old "box" should be banished absolutely. This specimen of antique ingenuity, with its ground glass always in the way of the plate-holder—each endeavour to insert the plate-holder developing into a struggle that shakes the camera out of position—its springs to keep the ground glass in its place growing limp and useless, that the focus is always untrue; surely such a camera should be abandoned as soon as possible, and ought never to be adopted when one of better construction can be obtained.

A camera, superior in every respect, is that with the ground glass fixed on hinges to swing back when the plate-carrier is inserted in the sliding-carriage. The bellows construction lightens the camera considerably, and makes it easier in the focussing movement. The *swing back* is for the adjustment of the plane of the ground glass (and of consequence, the surface of the plate in the carrier) to that of the image, an arrangement the advantages of which will commend themselves at once to my readers.

The Camera Stand should possess the qualities of steadiness, lightness and "moveability," and ease of adjustment, qualities few really do possess. The stand answering more nearly to this description is, I believe, of American manufacture; in form, like a small oblong kitchen table, the top of which can be adjusted by simple levers to angles that elevate or depress the lens as may be necessary. This stand presents a solid rest for the camera, admits of great scope of movement without hard and disagreeable work with screws that are always getting clogged or rusty, and is easily moved about the gallery, being fixed on castors.

Lenses should not be purchased by the inexperienced, and few, even among experienced operators, know enough about lenses to be able to make a wise selection without trial in the camera.

If, on placing the lens on a piece of pure white paper, its colour as seen through the lens appears changed to a yellowish or greenish tint, it is to be borne in mind that in proportion to the depth of tint the lens will lack in the actinic power required in photography, though the lens may be most admirable in every other respect. It will be "slow working," a property quite fatal to its use in portraiture.

It sometimes happens that the focus on the ground glass is not a true one; to test this, and ascertain whether it is forward or back of the plane of the ground glass, place a piece of printed paper in front of the lens in an inclined position, and, focussing sharply in the centre of the paper, make a negative. The letters focussed should, of course, be "sharpest" in the negative; but should the ground glass be out of position, the letters nearer to or further from the centre are in better focus than those focussed on the ground glass, which must be moved back or forward, as the case may be.

Care must be taken not to scratch the surfaces of the lenses in cleaning them (*paper should never be used*), as the delicate polish of the surface is easily injured. A piece of soft rag is the best thing for polishing, the breath giving

sufficient moisture to remove dirt; after which polishing, a camel's hair brush may be used to dust off the surface.

In removing the lenses of a portrait combination, there is a risk of reversing them in the replacing, and this is an extremely awkward accident in its results. The front lens, or that nearest the sitter, is a cemented achromatic, and must be mounted with its convex side outwards. With the back lens, place the cell on the table, and drop in the double convex lens; the ring which separates the lenses is next placed in position, and then the other glass, with its concave side next the lens already in place.

The lens must be chosen to suit the size of picture for which it is required: a card lens will not be suitable for a large head, and one adapted for large work will, for a carte-de-visite figure, require a long distance between it and the figure, possible only in a large gallery.

For groups a lens of long focus is the best, as it thereby gives greater depth of focus—i.e., the line of sharpness is broader; objects back and front of the plane on which the focus is made appear sharp and distinct; an immense advantage, where it is not always possible or desirable to place all the figures of the group in a line.

Diaphragms or Stops.—The image formed by the portrait lens having a curvature of field, or coming to a focus at unequal distances from the plane of the ground glass, causes those portions of the image farthest from the centre to be out of focus, unless the focus has been fixed on any point away from the centre, when the other parts are thrown out. This is caused by the form of the lens, though the defect is reduced to a minimum in the portrait combination. To correct this in a measure, stops, or little slips of sheet metal, with a hole in the centre, are inserted between the lenses, the effect of which is to stop out or prevent the action of certain rays, those farthest from the centre of the lens. The smaller the aperture of the stop, the sharper the entire image becomes, but it is at the expense of light, and consequently rapidity of working.

Head-rests should be firm, but not too heavy to be moved readily about the gallery.

THE COPYING STAND.

In copying pictures, especially prints, plans, &c., great exactness is necessary, and to secure this a well-made stand is necessary. Too often very makeshift arrangements satisfy the photographer, and in consequence many failures result. The best form for a copying stand is a long narrow table, fitted at one end with a stout upright bar, at perfect right angles with the table; on this is fitted a flat square board, which may be moved up and down at pleasure, and fixed with a spring or screw. By this means the picture is always perfectly on the plane of the camera, if it is properly on the table. To regulate this, two little ridges of wood are fixed to the surface of the table, running its entire length, separated, the distance corresponding to the width of your copying camera, and between these two ridges the camera is kept in position, so that the picture to be copied must come precisely in the centre, and also stand perfectly true as regards the camera. The table may be fitted with castors, that it may be easily moved, and with a long exposure and changing light, movement during the exposure is, with the observance of great care, possible.

Another useful form of copying stand may be fitted to the camera stand, if of the kind I have described. It is formed of two strong and fine bars of wood running in grooves, one on each side of the camera stand, and joined in front. In the front piece, the upright and board may be fitted in a moment by means of a screw. When not in use, these bars fit close to the front and side of the camera stand, and when required for copying they are pushed out to the required distance.

COPYING.

A rather old and reddish collodion is the best for copying; it is slow in working, but shortness of exposure is not so much an object as in portraiture.

Daguerotypes are best copied under two strong lights,

which may in most cases be cast on it by means of mirrors on opposite sides of the picture; in this way are the shadows caused by scratches in the silver plate destroyed. Sometimes, where the Daguerreotype is stained, it may be found necessary to clean it. This can be done by first dipping it in clean water, to evenly wet the surface. Then place a small piece of cyanide of potassium in water in a graduate. Flow this on and off the plate while the cyanide is dissolving, and until the plate becomes as clean as when new. Wash well in running water, and dry over a spirit lamp. This will not, of course, remove scratches or blemishes of the film.

Photographs should be retouched, waxed, and burnished, and copied in diffused light.

Engravings also are best copied in diffused light. Fix the negative with cyanide, to keep the lines clear; but be careful that it is not strong enough to have effect on the film. If the image has not sufficient contrast, intensify as before described.

Unmounted and wrinkled pictures should be placed in water and pressed out on a piece of glass, under which they can best be copied.

Oil Paintings require treatment varying according to their character.

ON THE INFLUENCE OF COLOURED RAYS UPON THE TONE OF POSITIVE PRINTS.

BY D. DE CLERQ.*

THE permanent printing processes are every day becoming so general that the experiments which I am about to speak of have lost some of their interest, having been exclusively conducted with chloride of silver paper. At the same time I think the results of my investigation will not prove uninteresting to my brother photographers. I will mention, first of all, how I was led to make the experiments of which I am about to speak. Obtaining sometimes clichés of a very feeble, or rather transparent, nature, which were incapable of furnishing good prints, although their half tones were well marked, I endeavoured to intensify them by means of a coloured varnish, as M. Fritz Luckhardt has recommended. This varnish is composed of

Alcohol ...	...	100 cubic cents.
Benzoin ...	...	10 grammes
Aniline red ...	...	quant. suff.

In 1873 I had prepared a quantity of this varnish as a store for some time. After several days the tint of this varnish completely changed, the red in its composition becoming of a violet-purple. According to my own idea, the effects of this varnish should have been quite different from what usually resulted from intensifying a cliché by its means; I abandoned it on this account, and resolved to employ instead some thin films of coloured gelatine to be placed between the cliché and the glass of the printing frame. At first I could only obtain pellicles of a yellow-citron colour, of a pale green and aniline red. With these I made some experiments. To my surprise, I found that the print which had been exposed to light under a rose-coloured film had assumed a brownish-rose tint; that which had been exposed under the yellow pellicle had a characteristic blue tone; and the third impression, exposed under a green pellicle, was of a greyish-blue tone. I renewed my experiments, this time with some precision, taking the same cliché, and exposing sometimes in sunshine and sometimes in shadow, under similar conditions of light, and always with the same results.

I then tried the sensitive paper of M. Durand. I prepared another silver bath of a stronger nature than I ordinarily used; I toned my prints in an acetate of soda gold bath. Always the same colorations appeared, more or less changed, but always visible. The fixing with hyposulphite of soda did not cause any change in the results obtained.

I reported my results to Mr. Wharton Simpson, and at

the same time sent him some prints, together with some of the coloured pellicles, and some samples of sensitive paper. He repeated my experiments, and obtained identical results.

I continued my experiments. Having obtained gelatine pellicles at Paris of almost every tint, I was enabled to obtain some singular results, which I have tabulated.

Colour of the Pellicle.	Colour of the Print Before Toning.	Colour of Print After Toning.
Colourless.	Warm chocolate brown.	Chocolate.
Light rose.	Rosy brown.	Rosy chocolate.
Dark rose.	Rose coloured.	Rosy brown.
Red.	Brownish red.	Brown.
Pale yellow.	Dark slate-coloured blue.	Lavender blue.
Dark yellow.	Blue.	Blue.
Green.	Slate-coloured blue.	Lavender blue.
Blue.	Chocolate brown.	Chocolate.
Purple.	Violet rose.	Purple brown.

I also made some experiments by superposing two pellicles of different tints. The results I obtained were as follows:—

Colour of the Pellicle.	Colour of the Print.	Colour of Print After Toning.
Rose-rose.	Brownish rose.	Brownish rose.
Rose-red.	Brownish rose.	Do. do.
Rose-yellow.	Nothing.	Nothing.
Red-yellow.	Do.	Do.
Purple-brown.	Do.	Do.
Brown-blue.	Do.	Do.
Green-blue.	Slate-coloured blue.	Lavender blue.
Green-yellow.	Blue.	Blue.

In all my experiments I made use of the same cliché, and fragments of the same sheet of sensitive paper. The pictures were all printed with the same amount of exposure to light.

To verify the delay which occurred in printing the cliché through these different coloured mediums, I pasted single and double pellicles on a glass plate, and employed the spectrum thus improvised. I obtained in this way an indication of the delay in printing caused by these coloured pellicles, and at the same time I got some notion of the intensifying character of each tint.

The following is the scale I obtained by pushing the printing so as to render that part of the sensitive paper placed under the colourless film of a blackish-bronze:—

- | | |
|---|-----------------------------------|
| 1. Colourless film (paper, black bronze). | 9. Dark yellow film. |
| 2. Blue film. | 10. Dark rose film. |
| 3. Light rose film. | 11. Greenish yellow film. |
| 4. Rose film. | 12. Bluish yellow film. |
| 5. Purple film. | 13. Brownish blue film. |
| 6. Purple blue film. | 14. Brown film. |
| 7. Green film. | 15. Yellowish red (paper, white). |
| 8. Yellow film. | |

The blue, therefore, intensifies least, and yellowish-red or orange, the most; the blue retards the operation of printing the least, and the orange the most. In other words, of all tints, the blue is the most antinic—a result it was easy to foresee.

A medium rose-coloured pellicle seems to be the most suitable for intensifying purposes, because while it retards the printing but little, it intensifies the image sufficiently, and does not alter the tone of the positive print. M. Fritz Luckhardt, therefore, indicated a very good mode of intensifying negatives when he recommended the testing of negatives with a collodion coloured with ro aniline. It is well known that the intensifying action is only used locally; that is to say, M. Luckhardt does not entirely cover the cliché with this coloured collodion, but applies it to those parts only which appear to be too transparent.

I have also remarked that there is sensible difference in the results obtained, according as the rose-coloured pellicle is placed in contact with the image during printing (between the collodion film and the sensitive paper), or

upon the back of the cliché. In the latter case the intensifying effect is much less accentuated than in the former.

This is easily explained: when the coloured pellicle is placed at the back of the cliché, the light, in traversing the glass to the image and the sensitive paper, becomes uniformly rose-coloured, and experiences the same change throughout. It is different, however, when the tinted pellicle is in immediate contact with the paper.

To resume: the issue of my experiments have led to three principal results:—

1. It is possible, by using coloured gelatine pellicles, to intensify a cliché. Rose aniline best fulfils the object to be attained, especially if the tinted pellicle is placed between the collodion image and the paper.

2. By employing pellicles of different colours, and cut in suitable shapes, it is possible to obtain prints differently toned in parts.

3. The tints obtained under the influence of various pellicles are fixed, and do not change, either on toning or fixing. I have in my possession some prints produced in August 1873, which since that period have lost nothing of their pristine colours.

"Have these results any scientific value?" it will be asked. I think so. Although at present far from complete, I have made them known in the hope that others will after me, and with me, take up the investigation; and I should be pleased, indeed, if any of my colleagues should be fortunate enough to carry the matter further than I have done.

THE PRACTICAL PRINTER IN AMERICA.

XXXIV.

FAILURES WITH THE POSITIVE PRINTING BATH.

THESE occur both in the making, working, and care of it.

In weighing out the nitrate of silver, or the nitrate of ammonium, &c., &c., always be sure that the scales are clean, and place small pieces of paper on both sides of the scales, of the same size, before weighing out anything, and you will be doubly sure then of perfect cleanliness. Use fresh pieces of paper every time you use the scales.

Never touch your fingers any more than what is absolutely necessary to the contents of your bottles, and when about to weigh out silver, &c., place a piece of the paper, previously placed in the scales, in your hand, and pour the silver in that.

In weighing out chemicals always be sure that you have reckoned the precise amount of grains, &c., correctly. It would be a good thing to have a table of ounces reduced to grains, and I will here give one for solids, such as nitrate of soda, &c., and also one for fluid measures.

Solids.			
20 grains	=	1 scruple	= 20 grains
3 scruples	=	1 drachm	= 60 "
8 drachms	=	1 ounce	= 480 "
12 ounces	=	1 pound	= 5760 "
Fluids.			
60 minims	...	...	= 1 fluid drachm
8 drachms	...	...	= 1 ounce
16 ounces	...	...	= 1 pint
8 pints	...	...	= 1 gallon

When about to make up solutions, always be sure that the bottles are clean.

In the mixing up of solutions, as per formulæ, if there is a particular way of mixing them given, always mix them in that order.

In the printing department, when pure water is recommended, and distilled is not at hand, then pure filtered rain-water, or clean melted ice, will answer.

In cold weather always warm your silver bath before using, and not float your paper on an ice-cold solution.

Make your bath stronger in cold weather, and also silver longer, than what you do in summer.

In the summer, printers are apt to get their bath too weak in silver; never let it get below thirty grains strong of pure nitrate of silver to the ounce of water, saying nothing of the other ingredients which are sometimes used in the composition of the bath.

Do not let your solution get too low in quantity, so that you will have to place in a large quantity of the stock at one time, as for the next day or two the bath will not work so well. Always have your stock, or adding solution, made up in the same proportion, as to ingredients, as was used in the first composition of your daily bath.

Always keep your printing bath in the dish covered up when not in use.

Pour your bath back into the bottle every night, clean your dish out, and set it away bottom upwards on a shelf covered with clean paper.

Filter your bath before using it the next day.

When the bath in the silvering dish is dirty, always skim it before using again.

When the bath is discoloured, which is due to the impurities which have been left in it from floating, &c., always clear up with a little kaolin, camphor, or permanganate of potash, &c., as has been explained in a former chapter.

Sun the bath when not in use.

Test your bath every morning before use, to ascertain both the strength of silver and the degree of alkalinity of the solution.

Be sure that your bath is a little alkaline, but never acid, unless you are using the citric acid printing bath, and then have it only a little so; but in the case when you are not using such a bath, never have the solution acid with nitric acid. Better results are obtained with either an alkaline or a neutral bath than with an acid one.

For a weak negative, and one inclined to be flat, a strong bath and a longer time of floating are required than when the opposite is the case.

Better prints are obtained by the addition of alum, or nitrate of ammonium, or both, to the bath solution, than what is obtained without them, as they coagulate the albumen, and keep the solution on the surface, making more brilliant prints, and being more easily washed in the final washing.

Boil your bath down two-thirds every month or so, and make up as before.

Use Pile's test-tube and solution for testing your bath when there is anything in it besides nitrate of silver, as the common hydrometer will mislead you.

When you wish to know the quantity of nitrate of ammonium, or soda, in your bath, and you are sure that the albumen and other impurities are out of it, then test with the hydrometer and with Pile's test (which is the only sure test for the silver), subtract the two, and the difference is one-half the number of grains of nitrate of ammonium in the bath. For instance, suppose you were to make up a silver bath of thirty grains strong to the ounce of water, and wishing nitrate of ammonium in the bath, you also put in thirty grains of this to the ounce. Test with hydrometer, and it will stand at 45 grains. Test with Pile's tube, and you will, of course (for you know in this case, for the bath was just made up, and has not been used), find it this time to stand at 30 grains. Subtract the two; 15 grains is left, which is half of the number of grains which you know was added. In the case just cited, the rule may not be required, for you know already the strength of the bath, and just how much nitrate of ammonium there is in it; but when a bath has been used for some time the amount of each is not known, then the above may be handy. Before using the above test, however, the printer should endeavour, as far as lies in his power, to remove all the organic matter from the bath, so that it will not deceive him.

MECHANICAL APPLIANCES FOR GOVERNING LIGHT.

BY C. E. MYERS.*

SINCE the National Photographic Association has presented to its members, through the courtesy of Mr. Kent, his handscreen proper, together with the result of his large experience in its use, the science of lighting has been greatly simplified and practically reversed in the actual theory of controlling it.

The first theory was to let in the light only when it was wanted, and the effort to reduce this to a system was published by Mr. Wharton Simpson in the *World*, October, 1871. He writes of a German artist, Mr. Stortz, whose principle was illustrated by a model studio, with shutters numbered, the various effects to be got by opening particular shutters found by experiment to correspond with various lighting effects.

The best illustration of this method is "Bigelow's Album of Lighting and Posing," published May, 1872, in which the attempt to reduce it to an accurate system is only prevented by the varying feature of the subjects themselves, nearly all requiring some individual variations to modify effects, as when a round face substituted for one with cavernous cheeks and eyes. As alluded to, the screen system is exactly the reverse of all others, and the sitter is usually placed at or near the centre of illumination, while the method itself is the barbarous "role of application" whereby a plug may be fitted to a hole by cutting and trying. This gives free scope to the variations in different faces, but it is in a degree useless in the hands of those not possessing also the artist's eyes, as the particularly favourable light has to be detected as the screen moves about. This accounts for the reason why photographers who are not real artists have not sooner admitted the merits of the handscreen, and so constantly used it. With natural taste or with practice, this use of the screen becomes intuitive, as any required effect can be got in less time than it takes to adjust a headrest.

In October, 1873, the *Philadelphia Photographer* published a contribution, illustrating and describing another arrangement of the screen. It consists of two sticks crossed to form a base; from this rises a stick six feet high, with a screw-eye at its top; near the top is a block of wood clamped to the post by a screw-eye. This block hinges to an arm carrying a square frame or screw, to which is attached a cord passing through the screw-eye at the top of the post, and terminating in a balancing weight. This apparatus can thus be cheaply made by any one of slight mechanical skill; the only fault in its plan being that its movements are limited to arcs of circles, in planes, in right angles to each other.

When I became an amateur photographer, I commenced experimenting in the direction of appliances for governing the light, and if I should be found speaking as one having authority, please consider that in pursuing a speciality, I have probably had a larger experience than any other person.

I kept a bright look out through the various journals, and I made numerous arrangements for modifying light, and took my pay out in that way. They didn't suit me, but I could no more help trying, than a hen with an egg to lay. What I wanted was a screen weighing less than four ounces. I also wanted it movable by one hand like a fan, and I was foolish enough to want it to remain in the air, suspended, as my hand left it, in position. The war-cry of American "cheek" is "Eureka." It is here. Two sticks four feet long cross to stretch the screen, fastened by four tacks; this third stick, four feet long, has a weighted handle at one end, while the other end is screwed to the crossing of the screen-stretcher. Near the handle the staff passes through a universal joint made spherical for symmetry; this completes the attachment—its weight

complete is two and a half pounds. It is wielded by the handle like the common hand-screen, and a socket in the sphere slips over the top of any head-rest shaft. As a preferable support, I use a head-rest base of iron, a column of wood with a metal cap forming a binding screw, to adjust the height of a shaft of hard wood or gas-pipe, making the whole light, cheap, easily carried, and hard to upset, because its weight is its base. The arrangement of the joint is such that it permits complete revolutions of the screw in any plane, and, by a "twist of the wrist," to occupy any angle or position as freely as a hand-screen not attached, and it is so perfectly poised that it remains firmly fixed when the hand lets go. If you want a hand-screen, here you have it. If a fixed screen, here you have it. If you want a flat reflector, here you have it. If you want a concave reflector to concentrate light on any one spot, the loose screen when inserted sags into a concave surface.

I trust that its perfect simplicity, lightness, and cheapness will not seem objectionable, as by ten minutes' practice with it as screen and reflector, the true science of lighting is better revealed than by days with other methods.

In connection with this simple attachment, I have had a large experience with the character of the screen employed. It seems natural to always think of the screen as thin enough to transmit considerable light. This is as great a mistake as to put ground-glass on an excellent north light. Translucent screens soften or modify light, but do not govern it; but this is accomplished by an opaque, or nearly opaque, screen. With either, more brilliant effects are got, and softness, also, by a similar screen, or by moving it farther away or out of the camera view. The opaque screen I also use advantageously over the camera itself, producing all the good effects of the tunnel light, without its defects.

As a semi-opaque screen I have always used the various-coloured paper cambrics, more or less non-actinic, or approximating to the colour of the blemishes of the face, such as freckles, tan, or scars, thus materially reducing the retouching of negatives, as the face is lighted all one colour.

Some years ago the screen here shown was a fine healthy pink, but the sunlight has had its revenge on it for being controlled, and leaky skylights have convinced me that there are some things which a screen will not do.

I can well believe that there will be some difference of opinion regarding my statements relative to the effects of the opaque, semi-opaque, or coloured screens; but I respectfully ask the fraternity to investigate the matter first, as I believe that an experience considerably less than mine will corroborate my views; the cheapness of the screen-stretcher, attached by a screw-eye, facilitates a change in the character of the screen in use.

It may be asked if my apparatus is patented. Luckily for the fraternity it is, and was not patented to persecute the craft, but in a hurry to foil an attempted piracy. I concluded to pay thirty-five dollars to Uncle Sam for a patent rather than give ten or fifteen dollars to "any other man" for the privilege of using my own invention. It rests on its own merits of simplicity, cheapness, and efficacy; and I do not intend to prosecute individual infringers, and I will give a licence, to make a screen or reflector, to any person who would rather pay for the trouble of merely writing it than for the perfect apparatus itself.

I think I can offer a better article, cheaper than they can afford to tinker one up, and adjust its peculiarities by experiment. I would remark that this is not a "light modifier," but a "light controller," capable of making a properly lighted head in a blinding glare of sunshine, by a common side window, or at the bottom of a well big enough to work it; and I present it to the fraternity to be by them wielded as a painter's brush, applying the light when needed.

The Photographic News.

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DRAWING PAPER FOR PHOTOGRAPHIC PORTRAITURE.

PHOTOGRAPHERS are a singularly conservative community, and pre-eminently disposed to let well alone. Since the adoption of albumenized paper for printing, nothing has served to loosen the firm hold it has obtained upon the affections of photographers. Artists have declaimed against its "vulgar gloss;" chemists have pointed out that a body like albumen, containing sulphur as a constituent, was inimical to permanency; and the constant recurrence of spots of various kinds, blisters, and other defects, have distressed the practical photographer; but none of these things have been able to put aside for a moment the use of albumenized paper. The marvellous progress of carbon printing has scarcely affected the use of albumenized paper in the slightest degree; and the highest standard to which the carbon printer aspires is the excellence of an albumenized print.

On careful reflection, there will be found nothing surprising in this. The usual method of printing upon albumenized paper does unquestionably give, with the least trouble, the least exercise of skill, and the greatest certainty, the highest general excellence—excellence of a kind that pleases, in the greatest number of instances, the public taste. Indeed, it is a fact worth noting that the public pictorial taste has been largely educated upon albumenized prints, and has come to look upon the glazed surface and crisp definition as necessary in the highest pictorial excellence. The late Mr. Bingham once observed to us that he had observed this curious educational process steadily going on for a number of years. Our readers know that Mr. Bingham devoted himself chiefly to the reproduction of original paintings by photography for publication. In the earlier years of this enterprise he found that persons of educated artistic taste objected strongly to the albumenized surface as vulgar and inartistic in texture, tolerating it only on the score of faithful and minute rendering of the drawing and details of the original printing. Gradually, however, a change of feeling was manifest: the albumenized print had grown in favour, and was regarded as the highest type of legitimacy in photographic art. So strong had this feeling grown that Mr. Bingham expressed to us a conviction, based upon trial and observation, that the public would not accept, as true photographic reproductions, any form of photograph but the albumenized print, or something indistinguishable from it. The best photo-collographic process, the best photo-engraving, yielding results perfect in literal accuracy, perfect in art qualities, would be rejected in favour of the albumenized print. It is not necessary to enter into all the causes for this preference. It is sufficient to note its existence, and to add that in many respects the albumenized print is worthy of it. As we have remarked, it is the most easily worked so as to secure tolerably uniform and good results.

The pictures appear brilliant, crisply defined, and the tone rich, compared with the somewhat sunken-in, weak, grey prints too often produced by plain paper printing; and they are free from the heavy opaqueness which has, unfortunately and unnecessarily, characterized too many carbon prints. With reasonable care they may be produced, if not absolutely permanent, at least so as to possess a long tenure of existence. For the mass of photographic printing, especially in small work, albumenized paper printing may, therefore, be expected to retain undisturbed possession of the confidence and preference of photographers and the public for many years to come.

But the conservatism to which we have referred may be carried too far. Variety and novelty are often important in a business point of view, and we wish to suggest trial of an experiment which will be found to possess value in an art point of view. We wish to point out the value of rough drawing-paper, white or tinted, for large heads. The experiment has occasionally been tried, but never, so far as we know, systematically carried out. There is, as all familiar with water-colour drawings know, an especial value in texture of surface, in giving softness and transparency in some degree equivalent to, and decidedly analogous to, the effect of stippling. It gives, in fact, something of the effect of broken tints to flat tints, and a certain luminous quality is thus produced which is exceedingly valuable, especially for pictures intended for hanging. Photographs especially need aid of this kind. Everyone must have been struck with the fact that a photograph from nature, which appears to be perfect when examined in the hand, has a somewhat heavy effect when hung on a wall and examined from a distance, and that this effect is rendered more apparent if an engraving hang near for comparison. This is chiefly due to the fact that the broken gradation of stipple or hatching has a more luminous effect—lets more light into the picture—than any gradation of greys in flat tint. A rough texture paper has a somewhat analogous effect: the tips of the little elevations catch the light, whilst the depressions are in soft, pearly grey shadow, giving general softness, and mellowing the keen, uncompromising definition of photography. Should the negative be somewhat hard, yielding a black-and-white picture, the effect of a rough, tinted drawing paper is amazing in removing harshness and giving the effect of texture.

Some time ago some American artists, appreciating the effects of which we have been speaking, attempted to produce it on large heads printed in the ordinary manner on albumenized paper, submitting them to pressure in contact with a surface like that of rough drawing paper. We have an example before us at this moment, and the effect is charming in many respects. It would resemble a very clever and effective drawing rather than a photograph, but for one thing: that is, the somewhat odd want of harmony between the albumenized surface and the texture of rough drawing-paper. Printing on the paper itself would be therefore much more satisfactory, and for vignette heads on plates of ten-by-eight and upwards, the effect would in almost every instance be found infinitely superior to that of albumenized paper. A pure white paper, or white with the very delicate tone inclining to cream generally found in drawing papers, is always good. A decided cream tint would often be found effective for prints to be finished in crayon, in which a light might be put into the eye, or on lace or linen, with white chalk. Grey tints, especially if inclining to green, should be avoided for portraiture, as out of all harmony with flesh tints.

As regards formulae and modes of working, we need not enter into much detail here. We have produced results which best satisfied ourselves, in vigour and richness, by the ammonio-nitrate printing process Turner's, Whittman's, or other good English paper was floated on a solution containing eighty grains of chloride of ammonium and fifteen grains of gelatine in a pint of water; dried and sensi-

tized with a sixty-grain ammonio-nitrate bath applied in the usual manner with a glass rod. The paper is sensitive, yields a vigorous image, and readily tones to a rich velvety black in an acetate bath. The toning bath should not be strong, and should be mature, and care should be used not to overtone, and so produce cold black and grey tints. In our last YEAR-BOOK, Mr. Sydney Smyth gave some good hints on printing on drawing-papers, which it may be useful to reproduce here. We may remark that Mr. Smyth has had very extended and successful experience in this little-practised style of printing, hence his hints possess especial value. He says:—

"I have been often asked by many of the young printers the best method of printing on plain paper. In my usual course of business I have to print many large size portraits on plain paper, both white and tinted—large vignetted heads, &c., to be finished in water-colours and crayons. Large vignettes printed on tinted paper, and then finished with black and white crayons, are very effective, and do not require any great amount of artistic ability to make them look very nice.

"As to permanency, I have two prints before me printed fifteen years or more, and I cannot trace the least signs of fading. I wish I could say the same of the albumenized prints. I am of opinion that if albumenized paper had never been introduced for printing, we should not have had the least cause to complain of faded photographs.

"Copies of crayon portraits should always be printed on plain paper; they look even better than the originals when reduced to a small size. Paintings and drawings to be coloured, also large landscapes, are very effective when painted, and are much more easily coloured than albumenized paper. There is a greater difficulty in procuring a good sample of salted paper than there is of albumenized. I have had samples that would not print in eight hours in a strong light, whereas it ought to print quicker than albumenized paper.

"Get a few sheets of Whatman's white and tinted drawing papers; select any suitable colour, or according to how you intend to finish your portrait, either in colours or black and white crayons. For small work, thick Saxe is the best. Salt it as follows:—

Chloride of ammonium	...	240 grains
Chloride of barium	...	480 "
Glenfield patent starch...	...	$\frac{1}{2}$ ounce.

Mix the starch in a small quantity of warm water, then add eighty ounces of boiling water; mix it well (this should make a beautiful clear solution); now add the salts (which will be equal to six grains of ammonium to the ounce), and strain through a tuft of cotton-wool. Float the paper until it lies perfectly flat, which will be in about six or eight minutes; hang it up to dry, then keep it perfectly flat until wanted. Float on a forty-grain silver bath; print rather deep. You will not require a very strong toning bath, as plain paper tones more quickly than albumenized. A good plan is to tone after a batch of ordinary prints; the bath being nearly exhausted, you will tone them with more ease and certainty. Any of the toning baths will answer, and you can get any tone you require. Fix as usual."

PROGRESS IN PHOTO-MECHANICAL PRINTING.

M. LEON VIDAL, in a recent communication to the *Moniteur de la Photographie*, gives some account of a new photo-mechanical press, which has been invented by MM. Brauneck and Maier of Mayence. This press is for rapidly printing, in greasy ink, any kind of photograph; it is of cylindrical form, and acts in a very rapid manner, pulling off the prints from films of gelatine.

The machine gives twelve to fifteen impressions per minute, and, no doubt, 20, 30, or 40,000 prints could be turned out in the establishment per diem. The photo-

graphs, according to M. Lacan, thus rapidly produced, are very fine and delicate, and rival in vigour and finish pictures produced by the ordinary silver process, while they possess, of course, the inestimable quality of being permanent.

It is said that a Paris publishing house, *La Societe Anonyme de Publications Periodiques*, has made arrangements to purchase the right of using this machine in Paris, and in a very short time M. Paul Dalloz, who is the director of the company, will be in a position to produce photographs in printer's ink, in very large numbers. Arrangements will be made to constitute photo-mechanical printing a speciality at the office of the *Moniteur Universel*, which has, as our readers are aware, already made arrangements for working M. Leon Vidal's photo-chromic process on an industrial scale.

GRADATION OF TINTS ON PHOTOGRAPHIC PAPERS.

BY CAPTAIN W. DE W. ARNEY.

I SEE in your last issue that Mr. Winstanley is going to explain a method of obtaining a gradation of tint on photographic paper. For the last year I have employed glass neutral tint wedges for the same purpose, which give perfect gradation. The intensity of the light penetrating obeys a well-known law, hence calculations can be made, if necessary, regarding the shades. Another plan (somewhat similar, I imagine, to Dr. Roscoe's, though I have not seen his described) is to cause a wheel, the spokes of which are cut into a leaf form, to rotate in front of sensitized paper. This gives a time gradation, while the last method gives an intensity gradation. Finally, to compare shades, I have adopted a rotating wheel, made as before, the leaves being of dead lampblack, resting on a pure white ground. The comparisons are, of course, made by the eye. These three contrivances give a perfect method of scaling tints. I have been experimenting in this direction for some considerable time, and have found that these three scales give me every possible combination I may require. Any one wishing for an actinometer scale, however, had better use that given by the wedges, and not the time scale; for in the latter the scale is too rapid at the white end, and hence is more difficult of comparison.

I need scarcely say the wedges must be very accurately ground. In diffused light a correction has to be made in the law for intensity, as the thickness of the wedge has to be taken into account, besides the absorption due to the thickness.

A SIMPLE METHOD OF PHOTO-MECHANICAL PRINTING.

BY M. ROGER LAURENT.*

Different application of the process.—After three or four inkings, as soon as the image has become delicate and clear, so that on regarding it by transmitted light no imperfections are to be seen, you pass to printing off the same upon wood, stone, metal, porcelain, glass, &c.

When printing on wood, similar to that employed by the gravers for typographical blocks, there is no need for the image to be reversed. It is necessary to have a typographical press at one's disposal, or at any rate a powerful letter-copying press, of a vertical character, for the rolling or scraping press will not answer the purpose. The gelatine block is placed upon the clean surface of wood, care being taken to obviate air-bubbles, which are removed by pricking with a fine needle without disturbing the picture. At the back of the block is placed a bit of cloth, of even thickness, and moist, and above, some thicknesses of ordinary paper, to act as a pad. On top is put, moreover, a sheet of india-rubber to regulate the pressure, and a piece of sheet tin or copper.

* Continued from page 377.

The block and the wood are pressed together, and withdrawn immediately. With a sponge you thoroughly moisten the back of the printing-block, and as soon as the gelatine has swollen, it is removed, when there should be no ink remaining on it.

To print upon metal, such as zinc or copper plates, the latter should in the first place be properly cleaned, planished, and polished, so as to have a perfectly smooth surface without any defect. The inked gelatine block is applied to the metal under water, and the air-bubbles carefully removed; on coming out off the water, the excess is squeezed out with the palm of the hand, and the two surfaces are allowed to dry, adhering to one another by atmospheric pressure, which is, as we know, fifteen pounds on the square inch. When the whole is perfectly dry, at the end of twenty-four hours, the metal and the block are again put into water for an hour or two, to swell the gelatine. The block is removed, and the ink remains in the metal.

In this way the process may be made to serve the purpose of engravers; the plate may be etched or electrolysed, the greasy ink acting as a preservative to those portions of the metal which it covers. The inked plates may also serve for zincography.

For printing upon stone the image must be reversed, and to do this it is necessary to have recourse to transfer ink—that is, fatty ink containing wax—and transfer paper, which is fine Indian paper, sized on one side and bibulous on the other. In working out a photo-lithographic process it is well, moreover, to secure the services of a skilful lithographic printer.

The printing-block is inked with transfer ink diluted with essence of lavender. You print, in the first place, upon transfer paper, on its sized surface; this impression is to be transferred to the stone. The latter having been properly prepared, the impression is laid upon it, air-bubbles being carefully excluded; and the print once laid down must not be shifted afterwards. A wet cloth is applied to the back of the paper, then a sheet of rubber to equalise the pressure, and then a metal plate. It is necessary to work promptly and decisively.

When pressing, a cushion either of rubber or cloth is put under the stone to prevent it breaking; and I prefer to employ a vertical rather than an ordinary lithographic press. After pressing, the back of the transfer paper is wetted with a moist sponge, and in this way removed.

It is necessary, perhaps, to say a few words about photographic manipulation, because it is one thing to produce a negative sufficiently good for silver printing, and another to secure a cliché suitable for heliographic purposes.

In the first place we may say that the glass plates employed must be scrupulously clean. A stock bottle of acidulated water, containing not less than ten per cent. of nitric acid, should be kept ready for use, and of this a few drops must be poured upon the plate, which is then rubbed with a clean rag, rinsed in pure water, and wiped. I recommend the use of that side of the glass which is concave.

For the iron developer I use the following formula:—

Water	1 litre
Protosulphate of iron, pure...	35 grammes
Sulphate of copper	35 "
Acetic acid	40 "
Alcohol	30 "

The employment of sulphate of copper with ammoniacal sulphate of iron is little known, but nevertheless it gives very clear negatives. The operation of development should be carefully watched, and as soon as all the details of the image have appeared, the developer should be removed, and the plate washed; if any delay occurs, the image becomes veiled in the delicate portions, and these

cannot then be rendered afterwards in the mechanical printing.

I do not advise the use of hyposulphite of soda, neither that of cyanide of potassium for fixing the negative. Sulphocyanide of ammonium, which fixes the cliché very perfectly, does not eat into it so brutally as cyanide.

Intensifying the cliché by means of pyrogallio acid I cannot recommend, because it has the effect of caking the finer details—a thing that must be prevented at all hazards. Again, it is not a bad thing to have a negative not very dense in the blacks; if only the clear parts of the negative are really transparent, it is well, indeed, if the negative is not too dense. It is best to time the exposure as accurately as possible, not to have recourse to pyrogallio acid for intensifying, but, after fixing and washing, to pour over a solution of one gramme of bichloride of gold in a litre of water, which is applied five or six times to the negative. This is also good for the process of reversing the film—a n operation I will now describe.

Reversing the Cliché.—In mechanical printing it is generally the case that a reversed cliché has to be employed. The most simple and shortest way assuredly is to photograph through the glass plate, the bare surface of the same being carefully wiped when it comes out of the dipping bath. To my thinking, however, a cliché secured in this way is not worth one reversed on a pellicle, and I advise those who wish to follow my footsteps to proceed as follows:—

As soon as the cliché has been finished and dried, there is poured upon it, instead of varnish, a warm solution of gelatine containing twenty per cent. of gelatine, the same having been carefully prepared. The glass plate must be laid perfectly horizontal, and maintained in a level position upon a dish of hot water. By means of a brush the warm liquid is spread over the cliché without injuring the collodion, while preventing the formation of air-bubbles. The cliché is removed from the hot water dish and placed upon a horizontal stand; and at the end of fifteen minutes, when the gelatine has set, it is allowed to dry spontaneously in a current of air, in a clean, well-aired apartment. When it is perfectly dry you cut round the margins with a knife, and in this way the film with the collodion image is readily removed, supposing the glass was perfectly clean to begin with. This pellicle of gelatine may be placed in a book; it occupies little room, and may be sent by post without inconvenience.

I also work in another way. I employ, as I have stated, sheet gelatine, which is pure and diaphanous, and of the best quality. I take as large a piece as is necessary to cover a cliché, and put it to soak in pure cold water for a couple of hours. In this state I apply the sheet gelatine to the dry, cold cliché, placed in a horizontal position upon a table, preventing the formation of air-bubbles by carefully raising the sheet without touching the collodion, and pricking them with a needle. A sheet, or sheets, of gelatine are laid upon the cliché in this way, the pieces crossing each other if need be, and then the plate is removed to the top of a hot water dish having a temperature of about 100° Cent. The gelatine melts, and with the aid of a soft brush you are enabled to produce a regular surface, and destroy any bubbles that may have formed. Afterwards the plate is removed to a level stand, and as soon as the gelatine has set, it is taken to an airy apartment, where it dries at the end of twelve, twenty-four, or thirty-six hours. The margins are then cut with a knife, and the film removed.

A third mode of operating may be mentioned. The essence of Eucalyptus possesses the property, when mixed with an equal volume of alcohol, to dissolve pyroxyline. Enough of this latter substance is, therefore, added to make a syrupy mixture, which is applied to a plate of very clean glass placed horizontally. This very thick film is allowed to dry thoroughly, and to remove it from the glass it is only necessary to steep it in water. Upon the cliché is

poured some alcohol in which a little resin has been dissolved, the film above mentioned is placed on top, and the two surfaces are pressed together and allowed to dry. Afterwards the negative is put into water, and the image with gun-cotton film detaches itself from the glass.

Sensitive gelatine paper.—I have told how to prepare gelatine paper, and how to sensitize it. Those who desire to do their work very well should proceed as follows:—The gelatine paper having been placed upon a flat board, a fine piece of linen of suitable size, saturated with a solution of bichromate of potash of three per cent. strength, is laid down once or twice upon the gelatine surface. When the whole surface of gelatine has in this way been made to imbibe the bichromate solution, and has become damp and supple, I lift off the linen, and I apply the gelatine paper against a well-cleaned glass plate, over the surface of which has previously been poured a three per cent. solution of bichromate. Atmospheric pressure causes the gelatine paper to adhere to the glass, and they are then removed to an airy dark room to undergo complete desiccation. The paper when it leaves the plate is as smooth as the glass itself, and must be carefully stored in the dark, when it will keep good two or three days. If the paper will not readily leave the glass, the latter was not properly cleaned in the first place. The best way of cleaning plates with acidulated water I have already described.

LANDSCAPE PHOTOGRAPHY.

BY THOMAS HINE.*

IN writing this paper, I will state, to begin, I have nothing to offer you, but the same old story that has been told so often by abler men than myself. My formula is the same I have used, with but slight variations, since I first took to viewing, and is as follows:—

Collodion.

Sulphuric ether	8 ounces
Alcohol	8 "
Bromide of cadmium	32 grains
Iodide of cadmium	32 "
Iodide of ammonium	32 "
Gun-cotton	80 "

My bath, thirty-five grains of nitrate of silver to the ounce for summer, and forty grains in winter, slightly acidified with c. p. nitric acid; my developer, fifteen to thirty grains of sulphate of iron to the ounce, according to my subject. After development, I flow my plate with just enough to cover it, of water ten ounces, acetic acid No. 8, two ounces; flow it backwards and forwards for a minute or two, and put it in my plate-box and finish it at home, strengthening, if it needs it, with pyro.

I wish I could impress on the minds of my brother photographers that it is not by this or that process that excellence is attained, but by close and earnest study. Do not think that because your chemicals are in perfect order, and your apparatus of the best, that all you have to do is to set up your camera and expose your plate; your negative may be faultless in chemical effect, but will it be an artistic picture? It is only by a thoughtfulness of the means at our command, and not by any secret process, that men like Wilson, Bedford, Good, and others produce the photographs we admire so much. Remember that it is not the colours and brushes that make the artist, but the following of certain rules of art, and an innate love of the beautiful in nature, only to be acquired by long study.

Spend some time, on arriving at the locality you are going to photograph, in going over the ground. If you can, go the day before, and having found your subject, view it from different stand-points; let the principal object come nearly in the centre of the picture, a little nearer to the right or left of it, as

the subject requires, and nearer the bottom than the top of the picture; study your foreground well, and if blank and uninteresting, place some object in it, such as a mass of foliage, or stump of a tree, to break the monotony, but be careful to so place them that they harmonize with the subject. A figure or group, if properly placed, will add life and interest to it.

The next thing to be considered is, have you chosen a good day? for, if you have not, it is useless to waste your plates. What I call a good day is one when the wind is still, for only then can you photograph foliage in all its beauty, or look down into the depths of the quiet lake and see reflected hill and mountain in all their grandeur. Another requisite is a good light. A day on which white clouds float lazily across the sky is the best. I find that early morning or late in the afternoon is the best for most subjects; then the shadows are longer, and you will get effects of light and shade, with none of that littleness of effect so often seen in photographs. If possible, expose your plate when a light cloud is passing over the sun; it will lighten up your shadows, and the gleam of sunshine after will give vigour and breadth to your photograph.

Use a sky shade to your lens; by so doing you may get a good cloud effect. Do not be afraid of shadow, for properly managed it is the glory of a picture; give a full exposure, and by careful development your high lights will not be overdone. Then expose your plate, but do not be satisfied with one exposure, for by a second, with a change in the time and in the strength of your developer, you may do better. Remember, it is better to go home with one good negative than a score of poor ones.

For architecture, do not let the sun shine square on the building, so that it glances along the shadowed side; let there be cast shadows, for without them you will have a flat, unmeaning effect.

For interiors, your chemicals must be in perfect order; if not, it is useless to try, for it is only under these conditions that I have been able to expose one and a-half and two hours, and get negatives free from mat-stains. I never use glycerine, or any other preservatives, to keep my plates moist. My bath and collodion are the same I use every day.

Correspondence.

HAS MR. CROUGHTON ANY CLAIM TO THE LAMBERTYPE PROCESS?

SIR,—As it has been confidently stated that Mr. Croughton has, by publishing the above process, established his right to be considered its author, I think the claim deserves investigation. It is not sufficient to state that Mr. C. has taught it to some pupils, or described it to private friends; this is not publication in the legal sense, so that the public may enjoy the benefit. I have therefore had the curiosity to read the original paper in which this process is said to be described. The paper was read before the South London Photographic Society in December, 1873. In it Mr. Croughton describes the steps he takes to make an enlarged negative. He details his method very minutely, but, useful as his plan is, he is careful to say that it is not new. He is right, as his manipulations all through are those of the usual wet collodion process. He first produces a transparency, and from it makes an enlarged negative. He then places tissue paper on the back and front of his negative; and here the coincidence occurs on which Mr. Croughton relies, for M. Lambert also places paper on each side of the enlarged negative. But though they each do this, the important point to notice is, why they do so. The words of M. Lambert in his specification, and of Mr. Croughton in his paper, supply the evidence of judging. It is unnecessary to quote the exact words of the specification, as they are given in your number of July 16th; but the purpose is

* Condensed from *Western Photographic News*.

clear: it is two-fold, to take advantage of the special texture of the paper M. Lambert uses—it is not ordinary tracing-paper, but a new material, *papier minéral*—and to supply a ready means for working upon with blacklead powder.

Mr. Croughton gives his reasons as follow:—"In elderly people the lines and texture of the face is far too marked in the enlarged negative; this can be much softened and reduced by printing through tracing-paper, so interposing a thickness of tracing-paper between the sensitive paper and the negative." Nothing can be clearer than this: the tissue paper was placed between the sensitive paper and the negative, not to afford a convenient vehicle for touching upon, but for softening and reducing the lines and texture of the face. No other reason is assigned by Mr. C. why he so placed the tissue paper, but this sufficient one. He confirms this when he explains why he puts tissue paper on the back of the negative; it is, not only "to soften the printing," but for an additional reason, "because it is a capital medium for working with the pencil to strengthen the high lights." His words are: "I always strain tracing-paper on the reverse side of the negative, as it serves to soften the printing, and is a capital medium for working upon with the pencil, to strengthen the high lights." Then he describes other details, but not a syllable about using the tracing-paper on the face for working upon.

It is very remarkable that if Mr. C. did use the tracing-paper on the face of the negative for any other purpose than the one he states, that he should not have mentioned it, especially as, in giving full details, he appeared to be honestly anxious to make a clean breast of his mode of working. Why did he mention the distinction he makes between the uses of the two papers? Why should he state that he used the front one to soften the printing, and the back one for that purpose and also to work upon, if he really worked upon both? That he did not work upon both sides, but only on the back, is confirmed by another part of his communication. Referring to an enlarged negative he exhibited as illustrating his mode of working, he says: "The large negative you will see is untouched, except that the stray locks of hair are more defined, pinholes and dust spots filled up, and the high lights throughout on tracing paper at the back."

I find that the discussion of the paper was postponed to the following meeting, January 1874, when Mr. Edwards opened with a paper in which he denied some of the merits of Mr. Croughton's method as contrasted with his own. An animated discussion arose, during which Mr. C. took active part, giving further details of his process; and although much was said about working on the original and on the enlarged negatives, as well as on the transparencies, yet not one word was said about working on the tracing-paper in front of the negatives. How was it, when he was so anxious to point out all the useful parts of his process, that he did not mention this one, which would have been both novel and useful?

In this journal, February 6, 1874, Mr. Croughton had an article, "More about Enlarging," in which he gives further minute details, that he states "are worth knowing, in order to get good results," but no word is said about the method in question.

I observe that the Editor of this journal had at the time a long and exhaustive article on the subject. In this he commented on and criticised the various expedients to secure and to improve enlarged negatives, yet he never mentions this expedient. Had the subject been mentioned—alive as he always is to all novelties and improvements—the matter could scarcely have escaped his attention, especially seeing that a few months later he so readily noticed it when he saw it in use by M. Lambert in Paris.

From a calm and dispassionate review of Mr. Croughton's papers, the discussion thereon, and the Editorial comments, I think no other conclusion can be come to than that Mr. Croughton and his friends are mistaken in asserting

that the method of working on tissue-paper on the face of the enlarged negative was published by Mr. Croughton in December 1873. He is never reported to have said in his paper, or in the discussion, that he worked on the tissue in front, but he distinctly says he put it there to soften the printing; but he twice in his paper says he worked on the tissue-paper, and in both cases he removes all doubt by stating that he worked on the back. I conclude, therefore, from the published evidence, that on the occasion cited Mr. Croughton did not publish this important fact, and that he has no claim whatever to the Lambertype process.—Yours, &c., CRATON.

THE LAMBERTYPE PATENT.

SIR,—I had been forewarned that I should create a great deal of jealousy amongst a certain class of anti-improvement photographers, always ready to play the professor, but never willing to learn, if I dared to introduce processes giving better results than their own; but the persistency with which they obtrude new misstatements and misrepresentations as soon as I have disposed of the old ones almost surpasses my expectations, and is becoming almost amusing to me.

Messrs Batho, Croughton, and Samuel Fry (of Surbiton) seem disposed to be prudent. Knowing that works and facts would be more compromising than equivokes and insinuations, they decline accepting any offer of mine to test fairly the relative value or similarity of my patented process with that of Mr. Croughton. Knowing practically the worth of the two methods, I can sympathise with their caution, which is surely their best policy. Notwithstanding all their evasions and equivokes, I fail to see any reason for their refusing the challenge of the test offered if their method be as good as mine, for if these gentlemen have nothing to learn from me, they can, with equally good processes, do equally good work; whilst if they have yet something to learn, they ought to be happy to have the opportunity of doing so. For my own part, I have always been happy to learn from others, and to pay for the instruction in anything which may help me to elevate the standard of my professional work. It is easy for them to state that my challenge is too ridiculous for them to accept it; so did the fox declare that the grapes were too sour for him.

Mr. Batho, after taking advice of his patent agent, as I advised him to do, admits that his knowledge of patent law is not so extensive as Mr. Lambert's, but denies having committed any blunders in his various assertions, saying that I took for granted that any and every legal point mentioned had direct application to the patent No. 1684. It is not so. Mr. Batho made three different assertions applying to patents in general, as your readers will see by referring to his first article in issue of July 23rd. First, he said that "if a patent be taken in joint names," &c. Now not one of my patents is taken in joint names. Secondly, "The invention must be new, and never used before in a business manner, even by the inventor." Although this last assertion has no relation to our case, I proved to Mr. Batho that his statement in this case is quite erroneous. Thirdly, he says: "If a specification claim as part of the invention something new, along with something not new, it will invalidate the patent." I proved to Mr. Batho that it is not so; that you can claim (not only describe) a thousand old things to be combined so as to give new results. I even gave a case in which was claimed the use of hot blast and anthracite coal for smelting. The hot blast had been before used with common coal, and cold blast with anthracite coal; so there was a claim of two old things combined to produce a new result. Now Mr. Batho has been unfortunate, for out of his three assertions on patent laws, one has no relation whatever to either of my three patents, and the two others are erroneous. Incapable of maintaining his first assertion, he goes on to say: "Mr. Lambert claims the method of applying the semi-translucid sheet on each side of a negative, and of quickly retouching by operating on these surfaces (Mr. Batho forgetting the following three essential words, "as herein specified"). Then he goes on to say that this may mean "method" or "application;" however, continues he, "as the specification does not describe the method, it must mean the application."

Now had Mr. Batho not thought it convenient to erase the three important words, "as herein specified," he would easily have perceived that both the method and application are fully described in my specification. Then follows another incorrect

assertion, Mr. Batho says, "As this has been applied before Mr. Lambert drops the claim to a semi-translucent sheet, and falls back on the retouching of the two said surfaces." Will this gentleman please to tell me where I dropped the claim to the sheets of paper? I have written but one letter on the Lambertype Patent, and I challenge him to prove that I have ever claimed anything which I do not still claim. I always claimed the combination of one sheet on both sides of a negative, and the retouching on these surfaces. I cannot drop the surfaces without dropping the retouching thereon, however pleasant this might be to Mr. Batho. Neither can I in a claim describe a working on a special surface without describing and claiming the new combination of both the surfaces, and work to produce new results.

The words, "and the retouching on these said surfaces," don't sound much like my dropping these two surfaces to retouch on the two bare sides of a negative. I quote from my specification: "What I claim as my invention is the method of applying a semi-translucent sheet on each side of the negative, and of quickly retouching on these surfaces." I am glad to see that Mr. Batho at last admits that if Mr. Croughton had used paper on both sides, but retouched only on the front or only on the reverse side of a negative, such would not invalidate Mr. Lambert's patent. Now we stand prepared to prove that Mr. Croughton only commercially used one of the two methods just described, and only published one of them; we can also prove that he taught his pupils only one of them, and that before the South London Society he used only one of the above-named methods; and we challenge Mr. Batho to prove that our process, as described in patent, has been either published or commercially used anterior to my patent.

Mr. Batho's only objection to accept our challenge is that we bind him to produce all the different results, chromotypes, &c. Well, we can afford to be lenient, so we shall only bind him to obtain all the results covered by the Lambertype Patent, outside of my two other patents, and I will give him double the time to produce as good effects, provided he uses none but processes commercially used or published before my patents, reserving the right to prosecute him should he infringe my patent. I am sure this will put a stop to Mr. Batho's scruples unless he finds it harder, as I think he does, to fight at a distance, with useless words instead of facts and proofs. The usual way of testing the range capacity of competing guns is to see how far the ball will reach with a certain charge of powder, and not for the competitors to lay their guns down and engage in a long controversy as to how far their respective guns have been said to, or might, or ought to reach, or, as Mr. Batho says, to lay the guns down and have a fight to prove which is the best.

Mr. Samuel Fry (of Surbiton) having in the issue of July 23rd thought proper to try to injure my process by asserting that he had seen the operations of the Lambertype, occupying several hours, I asserted that Mr. Fry had made an erroneous statement; that knowing in what capacity he came, he only saw the work obtained by, and not the operating of, the Lambertype which took several hours. I can prove my assertions by photographers present. I am glad to see that Mr. Fry has now thought it prudent to alter his statement, by saying it was the work and negatives of Mr. Lambert he saw, which is almost as different from his original statement as Mr. Croughton's process is from mine. Mr. Fry says, "I already had all I wanted, and all he had to sell." How is it, then, that Mr. Fry remarked to those present that he had got the Vanderweyde process for half-price, and that he did not intend giving more than £5 for my process? But as "good wine needs no bush," we did not take the hint from Mr. Samuel Fry, not thinking his favourable opinion worth the balance of £15. Mr. Fry then, shaking hands with me, said, in presence of my interpreter and Mr. Colton, photographer, of London, "I am pleased to have seen your negatives. I am always ready to repair any mistake I might make, and am glad to say the process is quite different from what I thought it was;" and said further that he would say so publicly, and that he hoped to see me at his house some evening, congratulating me on my ingenious processes. As I did not avail myself of his invitation, I received a reminder in the shape of a letter given me by Mr. Colton, and of which I have given a verbatim copy. Now notice that although Mr. Colton's address was Walworth Road, London, this letter was addressed at my house, for what purpose I leave it to my readers to judge. Notice also the date of this letter.

July 19th, 1875.
DEAR SIR,—It is now quite clear that Mr. Lambert's patent has been invented long before. In the PHOTOGRAPHIC NEWS of December 24th, 1873, the method of putting paper on each side of the negative is described in full by Mr. Croughton. I adopted it at once, and have used it since. Also Mr. Slingsby, of Lincoln, and many others did the same. I fear, as this fact is now generally known, your licences will be asking for their money back.—Yours very truly, (Signed) SAMUEL FRY.
Mr. Colton.

The words "your licences" sounds very much as if it was me, and not Mr. Colton. Mr. Fry wished to frighten. This letter was addressed 19, Ashburnham Grove, where Mr. Colton never resided. Mr. Colton, to whom it was forwarded, sent it back to me, saying it was concerning me, and not him. By-the-bye, Mr. Colton also adds a letter, too long to publish here, in which he says, "I have seen every one of Mr. Samuel Fry's negatives anterior to your patent, and must say that not one of them has paper on both sides with retouching on both sides." As I did not take any more notice of Mr. Fry's letter than I had the generous offer of £5 and his cordial invitation to his studio, it became generally known through Mr. Fry, on July 23rd (this letter to Mr. Colton was sent July 19th) that Mr. Croughton had previously used a paper on each side of the negative. This is the simple truth, and the profession is left to judge now the cause of Mr. Fry's opposition. This gentleman says in last week's paper that he preferred silver printing to chromotype. He has a right to do so, for there is work that gains by being perishable. But what Mr. Samuel Fry (of Surbiton) has no right to do, is to say that Mr. Croughton invented this method of papering both sides of a negative, and retouching thereon as described, whilst he knows that Mr. Croughton has never described any other method than that of printing through paper (and not retouching on) with a sheet of tracing paper strained on the reverse side of the negative to retouch on.

Mr. Croughton must really love to play the martyr if he can see any direct attacks on him in my last letter; but he makes a grand mistake when he thinks I will be sorry to have defended myself against erroneous insinuations, and in so doing have forced him to answer. Out of six licences here to-day, three were present when Mr. Croughton explained the process before the Society; one was his pupil, but the two others say that it is owing to the attacks on my patent that they have come to see the processes, knowing that if they were not good, they would not be thought worthy of so much and so persistent attack from non-licences, and so much praise from the licences.

Let all those who are not willing to pay for the use of my patent, use the method described by Mr. Werge, or use ground glass varnish on both sides of negatives to retouch on. Of course, as Mr. Werge says in his letter, "no other method will produce as good results as the one of Mr. Lambert's," but this is no reason why these gentlemen should not use them to save the sum of £20.

A few more short answers, and I have done. Mr. Batho asks me what is a conspiracy fund. It is a fund raised by many men to fight one man; for instance, the fund hinted at by Mr. Slingsby would be a conspiracy fund, and as such illegal. Mr. Batho also, in stating why he does not go to law about this matter, says, that "victory in such a case in our courts, oftener than otherwise, is as costly to the victor as it is to the vanquished, which is the cause of many acts of injustice being submitted to." If Mr. Batho dares not, why advise others to? As, on a journey through England, I shall visit Halifax very soon, Mr. B. will have a chance of accepting the test I propose in his own town, or, at least, of comparing results.

As Mr. Croughton seems to begrudge our giving the £50 to the Society, I will give it to him if he gains the challenge.

Allow me, Mr. Editor, to thank these gentlemen for the great help they have given me, as proved by all my new licences. My knowledge of their powerlessness will be seen by my raising the prices of licences on the 15th of this month, and of doubling them on the 15th of November. I am almost certain to count these gentlemen amongst my licences when the public will begin to understand that, notwithstanding the opinion of Mr. Fry of Surbiton, durability in good portraits is a quality.—Yours truly, LAMBERT.

Greenwich, August, 10th.

Talk in the Studio.

MINIATURE PAINTING v. PHOTOGRAPHY.—The following extract from Bayle Bernard's *Life of Samuel Lover* may possibly be suggestive to those who insist on the uncompromising truth of photography, and protest against any attempt to ameliorate its stern truth:—"I scarcely need remind my reader that miniature painting as a pursuit was annihilated by photography. I confess I am not one of those who are perfectly content with this result. Admitting all the advantages of the latter in respect to cheapness and ease of production, I find it difficult to think that its grim and severe reality, its sudden and unexpected revelation of human ugliness, and its inability to soften it with the faintest gleam of mind or feeling, make it preferable to a process which, in able hands at least, was always capable of giving us sufficient truth of feature, combined with some glow of grace and beauty, and some refining light of soul."

KEEPING QUALITIES IN DRY PLATES.—A friend sends us the following extract from a private letter written by Count Nostitz, an able amateur photographer in Russia. Three years constitute a good test of the keeping qualities of dry plates. The Count says:—"I have made in these days an experiment that has astonished me. If you see Mr. Simpson or Mr. Gordon, tell them that a dry plate prepared in April, 1872, on the system of M. Constant of Lausanne, with its preservative (140 water, 0.5 pyro, and 4 burnt sugar), which I exposed 1½ minutes with Dallmeyer's large-angle No. 2 diaphragm, gave me a good result. Also an old plate (three years) and which had been kept through a winter of 25° Reaumur of cold, and 38° of heat in summer, had not lost its sensitiveness. The developer was alkaline."

WHY THE LADY FAINTED.—A correspondent of one of our American contemporaries some time ago gave the following:—"I send you the following actual occurrence which happened on my summer tour. A lady subject had been posed, lighted, &c., and requested to keep the position she had been placed in until my return from the dark room. After my return, I found her as still and as rigid as a plaster cast. The plate-holder being placed in the camera, and the shutter drawn, I again requested her to keep quietly seated for a short time, and look at the piece of paper pasted on the corner of the box; she might wink the eyes, but otherwise keep perfectly quiet. I turned my back upon her, and after fifteen seconds' exposure I heard something drop—my subject had fainted. After restoring her she exclaimed, 'I tried it, Mr. —, but I could not hold my breath any longer; indeed I could not.'"

DETECTION OF ARSENIC.—The detection of arsenic is so simple that any one can perform the experiment in a few moments. We cut off a piece of suspected calico and immersed it in some strong ammonia which we had poured into a tumbler; a blue colour at once indicated the presence of copper. A drop of the blue liquid put upon a crystal of nitrate of silver turned immediately canary yellow, which reaction denoted arsenic. This is an experiment that anybody can try. To confirm our suspicions, we poured some of the liquid into a Marsh apparatus, and easily obtained the well-known deposit of metallic arsenic on glass or porcelain. With wall paper a neat and easy way is to put a drop of nitric acid on the green spot, then a drop of ammonia, when the colour will turn blue, and on addition of a drop of nitrate of silver, if arsenic be present, a yellow stain will spread in a ring to the outer extremity.—*Scientific American.*

To Correspondents.

SUMMERS.—The amount of pure metallic silver in pure chloride of silver is .752, or, in other words, seventy-five per cent. You must be very careful, however, to see that the chloride of silver you have is really pure, for photographers are frequently very careless in throwing it down in their residue-tub, and get a good deal of foreign matter mixed with the chloride. Washing and filtering will do a good deal towards cleansing the chloride.

E. H. D.—We fear that we have scarcely understood your claim; if it be that you have been in the habit of applying to paper the double coating of insoluble gelatine and lac, and using the paper so prepared as a temporary support for developing the carbon print in the same way as that described by Mr. Sawyer, then it seems clear that you would have anticipated Mr. Sawyer's patent, provided that you had ever published the method. Publication, not simply use, is necessary to constitute precedence in relation to a patent. In relation to your question as to the practice of Mr. Johnson, we believe that he used both gelatine and lac, made insoluble, but not in the combination and for the purpose of Mr. Sawyer.

NILE.—We regret that we have no means of knowing whether photography flourishes in Alexandria in Egypt or not, nor have we any means of ascertaining the names of photographers there, nor of knowing whether any chance of obtaining an engagement there exists.

W. W.—The formula for a toning bath which you quote will probably give good results, but not, we should think, freshly mixed. We should prefer to mix the two solutions at least forty-eight hours before use; or, if we wished to use when freshly mixed, we should make each of the separate solutions with about one-third of the proportion of water named, and on mixing add the remainder of the water required in a boiling state, and use it when the bath became cold. The use of hot water will bring about maturity in an hour, which, otherwise, might require a couple of days. 2. There is no reason whatever to suppose that a print toned in the acetate bath will be less permanent than one toned in the carbonate of soda or other toning bath; that is, if the precaution be taken to wash the prints after toning, before placing them in the fixing bath. In a ripe acetate of soda bath there is generally a trace of free acetic acid liberated, hence it is necessary to wash the print to prevent the risk of decomposition of the hypo bath. 3. There is no efficient method of cleaning tarnished Daguerreotypes, that we know of, without the use of cyanide. That is the only purpose in photography for which cyanide is absolutely necessary.

A LOVER OF THE BLACK ART says: "Is photography progressing or retrograding? Progressing, in one sense, when we see such beautiful effects worked out nowadays; but retrograding in another. How is it that photographers are running into one another's connection and getting their friends to tout for them, the same as you see the door-men in the back parts of London? There are men having a good connection in their own town, trying their utmost to get into another connection, leaving no stone unturned to do it, by getting people to send all they can, and get them all the work out to do, and yet these men are living miles away. Is it not lowering the profession to see such work, making it a complete piddling trade? Another firm in London gives ten per cent. commission to people to recommend them. Photography has got to give such beautiful results now, it seems a pity that there should be such mean tricks resorted to." Our correspondent should learn to make a distinction between photography as an art-science, and the persons who may practise it. The real process of photography has really nothing to do with the mode in which it is conducted as a trade or profession. We cannot undertake to define the precise limit of commercial enterprises in endeavouring to secure a connection. The effort to use influence of every kind to enlarge a connection is a characteristic of the keen spirit of competition which prevails in the present day, and it is beyond our province to define the legitimate limits of such effort.

C. R.—The stains are, no doubt, due to hyposulphite of soda, the pictures having been contaminated, probably after washing. Touching with soiled fingers, or with a damp rag that has soda solution on it, would cause the markings. Read Dr. Vogel on "Hypsulphite in Bristol Boards," page 57, *YEAR-BOOK 1874*, in which he describes the best way of testing for traces of hyposulphite. You might easily repeat his experiments on your prints. We will be bound you will find hypo present. The prints are very creditable, No. 1 being especially good. Some people use light blue curtains with good effect in their studios, but ordinary white calico will be found to answer most purposes. Heighway's system of working blinds is a very good one.

IODINE.—You are right, no doubt, in attributing the intensity to imperfect permeation of the varnish. We should think that the negatives have not been evenly coated with gum in the first place, or the surface has become greasy and soiled during retouching; hence the reason why the varnish will not take properly. Covering up the negative carefully while retouching should prevent this. A very weak albumen solution should be employed for the preliminary coating of glass plates, and then the bath will not suffer if the albumen is properly applied. The back and edges of the plate should be cleaned. Twenty or thirty ounces of distilled water added to the white of one egg, well beaten up, is a good mixture, a couple of drops of ammonia being added, and the solution finally filtered. Coat with a glass rod, or, better still, the Blanchard brush.

IGNORAMUS.—See answer to "C. R." Hypo is evidently the matter with the yellow prints: they have been dried in a dirty pad. One of them seems, moreover, to have been heated, and the albumen discoloured in this way. The portrait of a gentleman has had silver solution splashed over it, we should think. More care in washing and drying should at once put rid of the defects.

JOHN THURMAN.—You do not say the size of your pictures. Half a guinea for a carte negative would not be too much.

EMERY.—In our last issue, the two lines at top of first column of page 395 were misplaced, and should have been at the bottom of the second column on the same page.

"The absence of the Editor's name here may possibly be a mistake, or a misprint, but we are not responsible for it."

Several correspondents in our last issue.

The Photographic News, August 20, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. PHOTOGRAPHING UNDER DIFFICULTIES—LIFE IN PHOTOGRAPHIC PICTURES—PRINTING ON TINTED DRAWING PAPER.

Photographing under Difficulties.—A cat may look at a king, we have been given to understand, but in Paris a photographer may not look at any public building, it seems, at any rate through the camera. If he wishes to photograph a statue, or a palace, or a government office, it is necessary in the first place to get a permit to do so from the Prefecture of Police. Although this appears somewhat of an arbitrary proceeding on the part of the Paris authorities, one can scarcely grumble at it just now, seeing that some portions of France are still declared to be in a "state of siege," and it is natural, therefore, that no sketching, either with the pencil or the camera, should be allowed without permission. "No sketching allowed near the fortifications," is a sentence one often reads in Continental Murray, and every landscape photographer who has been through the Tyrol knows it is necessary to keep the camera out of sight of the garrisons which beset the passes of the Finstermünz, the Stelvio, the Brenner, &c. Our brethren in Paris, we hear, do not protest against the law which renders it necessary that they must obtain permission before proceeding to photograph the streets of Paris, although, supposing it to be the "state of siege" which is the cause of such precautions, it would be difficult to point out how the enemy, whoever he is, could be benefitted by such proceedings; but they take exception, and very reasonably, we think, to one of the clauses, which specifies that they must only operate on the day and at the hour fixed in the permit, so that if the day happens to be unfavourable, or there should be a shower of rain just at the hour mentioned, there is all the trouble to be gone through again to obtain another permission. Paris photographers ask that at any rate two or three opportunities should be given them, so that they should have some chance against the fickle sun; for, as every disciple of the camera knows, it is not very often that the first plate is altogether successful. Of course the Prefect of Police knows his own business best, but we should have thought that in times of peace like these, it would be well to relax altogether such unpleasant strictures. It might be very inconvenient, doubtless, if a photographer set about his work in the middle of the day in a crowded thoroughfare, but he would scarcely do this for his own sake, both for fear of being mobbed, and because it would be impossible for him to get a satisfactory picture under the circumstances. It is only at a passably quiet hour in the morning, or evening, that a photographer could hope to be successful in a business thoroughfare, unless, indeed, he desired to produce a small instantaneous picture of the scene before him.

Life in Photographic Pictures.—While on the subject of photographing scenes in town, we may say a word on the very unsatisfactory results obtained, when a busy street is reproduced in early morning, without a living soul in it. In such a case the photographer, in his anxiety to get a quiet exposure, has erred on the other side. A group of half-a-dozen passers-by, a horse and vehicle of some sort, in the foreground, would often be sufficient to people the scene he desires to depict; but so anxious is he not to have a movement, that no human being is represented at all in a thoroughfare which most people only see teeming with life. The result is not a true representation of a street in London, or a bridge in Paris, but a portion of what seems to be a city of the dead. Such a picture is as much like the real thing as a dead man is like a living one. It is here that the photographer fails most singularly in reproducing nature, for he magnifies his own special weakness. It was one of Rejlander's oft-repeated maxims, "Get life into your picture;" and in most urban pictures one sees the photographer at his very worst. You may

observe photographs of the Strand and Fleet Street without a trace of animal life, as Macaulay's New Zealander may see them one of these days, if the race only lives long enough; quays at Rotterdam, and squares in Paris, are shown as if it were the time of the plague, and the whole of the inhabitants had gone away, no one knows whither. We do not say that all photographic works of the kind are like this; there are exceptions we could point out, but they are very marked ones. A little picture of Frank Good's is in our memory as we write, showing the Tower with a group of people at the gates, and the row of cabs on the stand on Tower Hill, one of the Hansom cabbies quietly enjoying a newspaper on his perch. Good landscape photographers know how important life is in a picture; and how successful you may be in securing it is shown in Russell Manners Gordon's little Welsh study with half-a-dozen sheep grazing, which will be remembered by many in the London Photographic Society's exhibition some years ago. Messrs. Robinson and Cherrill have also shown us what may be done in the way of introducing life into photographs, as also Mr. Bedford and several other photographers of *premier rang*; and young photographers would do very well to study the pictures of those artists to show what really can be done with a camera. We know it is far easier to take a photograph of nothing more lively than stock or stone, but it will not do to consult your own convenience merely, if you wish to secure anything above the general run of photographic productions.

Printing on Tinted Drawing Paper.—Very few photographers of recent standing know what pretty effects can be secured by discarding glazed albumenized paper, and employing tinted drawing paper for printing purposes. In the early days of albumenized paper, photographers had far more experience in printing upon different kinds of paper than they have now, when most people merely choose the albumenized paper they like best; while a few, like Mr. Bruce, of Dunse, who do not object to a little extra work in order to give greater excellence to their productions, use collodio-chloride paper. Previously, however, plainsalted paper and resinized paper were much in vogue; but beyond the remarks made a few years back by M. Constant-Delessert, there have been no pleas put forward of late for any other silver printing process than that of albumenized paper. We had the pleasure of seeing a collection of M. de Constant's works at the Paris Exhibition four or five years ago, and we are sorry that photographers in this country had not an opportunity of looking at these charming productions. M. de Constant's views were of lake and forest scenery, and printed upon sensitized Whatman paper of various tints—blue, grey, &c. The coarse texture of the surface added materially to the pretty scenes, and some of them had the appearance of little water-colour sketches. There was nothing secret in the production of the prints, for M. de Constant explained his *modus operandi* very clearly in our YEAR-BOOK and in the columns of this journal. A negative was printed on several kinds of paper in order to see which tint was most suitable, and the approved colour was adopted. To amateur landscape photographers, who take a personal interest in the scenes they visit and depict in the camera, this method of printing on tinted drawing paper has many recommendations. M. de Constant prefers to employ the plain salting process, but some spread a thin layer of albumen over the coarse texture before sensitizing.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XIV.

PHOTOGRAPHIC ÆSTHETICS.

In this branch of my subject, difficulties beset one at every step, because a great majority of photographers are

ignorant of the principles of art, and many among them quite ridicule any combination of photography and art.

To counteract, so far as is possible, this very erroneous idea, it may be useful to give a few hints on the application of art principles in the daily work of the studio; and here, in the limited space at my command, and the necessity for simplicity of treatment of the subject, are difficulties enough.

Likeness is certainly the first object of importance to the photographer. Scarcely second to it is artistic arrangement; but art culture, by educating the eye to seize salient features, to select the most suitable view, and to arrange the light to the best advantage, to bring out the effect of character, as well as giving prominence and force to natural advantages, and concealing defects, really aids the photographer in securing likeness.

It cannot be denied by any one with experience of the different results obtained by different photographers, that superiority is attendant on the higher knowledge, not only of chemicals and manipulations, but of the principles and application of art; nor is it the cultivated eye alone that demands good composition in a picture, but the ignorant and uneducated experience a sense of fitness and symmetry in the well-balanced work, though they may not be able to define the cause.

Balance.—With the portrait photographer is the power, to a great extent, of governing the disposition of the lines. He may, if he find several lines running in the same direction, alter the pose or the drapery to introduce opposing lines to the composition, or even, by means of a curtain or accessories, to supply them. The necessity of lines of balance in a picture cannot fail to strike one with the most limited appreciation of art on looking at a picture devoid of such lines. If the lines run in one direction, diagonally, whether parallel or not, a weak, tumble-down appearance is given, and a sense of falling is suggested to the mind of the spectator. It may be urged that it being necessary to supply compensating lines to those of diagonal tendency, it would be safer and more satisfactory not to use them all, but rely on the horizontal and vertical form. The answer to this is, that in the last-named there is not sufficient variety, and that the picturesqueness of the pyramidal form is far greater than of the square.

As an example of the pyramidal form of composition, the reader cannot have a better than Wilkie's "Blind Beggar," or read a better little treatise on art than Mr. H. P. Robinson's remarks thereon in his "Pictorial Effect in Photography."

Variety, as a quality of good composition, is of such obvious necessity as to need no lengthy argument for a recognition of its power; its antithesis, monotony, is quite fatal to a picture. In fact, it may be said that composition teaches the proper use of variety. One of the chief sources of beauty and picturesqueness is variety, idealising the real; but, notwithstanding its power as one of the principal characteristics of symmetry and beauty, even of its absolute necessity in the production of the picturesque, it may be, and often is, carried to excess.

Simplicity must not be lost, or, like the rhetorician who becomes involved in his argument, be it never so ingenious, producing in the minds of his hearers a helpless feeling of being entangled in a labyrinth of metaphor, and the result is—chaos. Variety should be studied in photography for the sake of contrast; but simplicity and repose must not be lost sight of. Nor are uniformity and simplicity in composition antagonistic to variety, but, as in the case of a group, the introduction of repetition in some of the figures, amid their varied and irregular positions, will actually increase rather than diminish the variety, and give motive to the composition.

Brilliance is a very necessary quality in portrait photography, and is an effect produced by the illumination, not the chemicals. There is a prevalent and erroneous idea

among photographers that the nearer the sitter is placed to the light, the harsher the result; whereas just the opposite is the consequence. The nearer the sitter is placed to the light the more brilliant, but not of necessity, any the harsher is the effect. Distance from a weak light generally tends to harshness (or that quality known as "hardness" of the negative); therefore, if the sitter is seated a long way from the light, and softness is the required effect, admit more light, rather than cut it off.

Relief.—Do not in this respect attempt too much. As a flat effect, without proper shadow and contrast, is very unpleasing, so is the opposite extreme inartistic. A certain amount of relief is necessary, to give roundness and solidity to the picture, in the same way that a degree of contrast is requisite; but as violent contrasts produce harshness, so too great appearance of relief gives a hard wooden appearance.

There is great difficulty in treating of these matters within the limits of this chapter, for all the writer can indicate is that there is a certain point beyond which it is vulgar and inartistic to go, without having the power to define this line of demarcation. The student must study art and the works of the great masters to be able to appreciate the distinction for himself.

It must not be supposed that even on this domain of art that the artist, with only his artistic knowledge to guide him, can walk at once into a photographic atelier and pose and illuminate properly, in a photographic sense. It is not so, because the effect produced by our chemicals is not that seen by the eye; the pose is restricted in a certain sense by the imperfections of the lens, as the lighting must be modified to produce a given effect on the sensitized plate. Contrasts which to the eye of the artist are correct enough, are much more violent when portrayed by the camera. What is wanted is the artistic photographer.

PHOTO-MECHANICAL PRINTING.

BY E. BIERSTADT.*

THE art of illustration has become a necessity both for educational purposes and for objects of pleasure; a picture of anything in nature will give a better idea of the object than any word description, and any method by which it can be produced is a subject of interest, especially to photographers.

Photography is unrivalled for absolute truthfulness in its productions, and had the ancients been acquainted with this art in its present state of perfection they would have given us a clearer knowledge of the past than we can glean from their writings.

We have the art of catching a shadow and examining it at our leisure; let us see to it that we make it so permanent that we may hand it down to posterity unchanged.

How often do we look over our collections of photographs for some well-known face or view, and find that what was once a beautiful picture is scarcely anything more than a piece of yellow paper with a few brownish spots where were once the deepest shadows, all the rest having vanished! No matter how carefully photographs are made, if they are produced chemically, they can be destroyed by chemicals. No one can tell how soon a picture may be exposed to some element that will dissolve it. This fact has been known from the first discovery of the art of photography, and absolute permanence has been sought from the beginning, but found only in the use of pigments.

Pictures in permanent pigments may be safely handed down to posterity with a perfect confidence in the expectation that the shadow may be seen long after the substance has faded. This permanency is attained by means of some of the photo-mechanical printing processes.

"Photo-Mechanical Printing" is a term that can be applied to so many different methods of producing pictures

* Read before the Photographic Section of the American Institute.

that is necessary to name a few of them before considering the one with which I am most familiar.

The "Phototype," or "Actinic Process," furnishes blocks which are printed from in the same manner as ordinary types. The relief is produced by the swelling properties of gelatine, from which an electrotpe or stereotype is made, or a metal plate is etched with acid.

Photo-lithography comprehends that branch of photo-mechanical printing which produces impressions from lithographic stones by making transfers by photographic means; these two methods are rarely used for anything except line work.

Photo-zincograph is similar to the photo-lithograph; using a zinc plate instead of a stone.

Heliography is a name given to various processes for plates which are etched and printed from in the same manner as ordinary copper plate.

The Woodburytype must also be classed with the photo-mechanical printing methods, although the ink used is gelatinous, and not fatty, as in all others named; this produces pictures in half tone which cannot be distinguished from silver prints.

The photo-collographic printing process is that which produces pictures printed from a surface of gelatine prepared by photographic agency; this will principally form the subject of this paper.

Gelatine, which forms the surface from which these pictures are printed, is made from the skins, sinews, bones, and cartilage of animals. Chemists tell us very little of gelatine, except the process for manufacturing it, and nothing about its photographic properties; but they tell us that some kinds contain chondrine, particularly that made from bones and cartilage; and we learn also that the precipitate formed by adding a coagulating material to chondrine is redissolved when added in excess, which is not the case with gelatine. There are two methods for manufacturing gelatine, one by means of boiling the materials under steam pressure, and the other by treatment with acids; the latter yields gelatine more soluble than the former. In practice we find that the most insoluble kind is best for a printing surface; from this we infer that for this purpose gelatine should be made without acid, and if we require perfect coagulation we must use the kind that has the least chondrine in it, which is that made from skins, parchments, and sinews.

From my experience with the various kinds of gelatine, I would expect the best to be made of selected materials, purified or cleansed before manufacture; as any attempt at refining or clarifying after manufacture will be sure to remove some of the qualities which are essential to a good printing film.

The sensitive material, in all cases where gelatinous solutions are used, is bichromate of potash, bichromate of ammonia, or some chromic acid salt, the effect of which, when mixed with gelatine, dried, and exposed to light, is to render the latter insoluble, and by a prolonged exposure perfectly non-absorbent.

It is generally conceded that the first mention made of bichromate of potash in photography was by Mungo Ponton, who announced to the Royal Scottish Society of Arts, on May 29th, 1839, that paper saturated with that salt, then dried and exposed to the sun's rays through a drawing of some object, would produce a yellow picture on an orange ground. To fix it, all that was required was to immerse it in water to wash out the bichromate, and a permanent picture in white on an orange ground was obtained.

In 1840, M. E. Becquerel discovered that sized paper, when saturated with bichromate of potash, was more sensitive than unsized. In the same year Mr. Joseph Dixon, an American, astonished the inhabitants of Massachusetts, where he resided, by exhibiting reproductions of bank notes, made with such fidelity as to defy detection, and which, he said, were printed from stone prepared by photographic agency. The details of his

process were not made public until 1854, when they appeared in the *Scientific American* for April 15th, page 242. He used gum-arabic and bichromate of potash spread direct upon stone, and, after isolation, inked, washed, and etched as in lithography.

In October, 1852, William Henry Fox Talbot patented a photo-engraving process. After coating a steel plate with bichromated gelatine, he impressed it with a photographic image through a negative by means of a copying frame, then washed; the washing removed all the bichromate, and the greater part of the gelatine, from the portions of the plate upon which the sun's rays had not acted; after drying, the plate was etched by a solution of bichloride of platinum, containing a little free acid and water; it was then printed from in a copper-plate press.

Mr. Paul Pretsch patented his process in November, 1854, which consisted of a surface coated with glue, nitrate of silver, iodide of potassium, and bichromate of potash; the subject to be copied was laid on this prepared surface, and exposed to the light; after exposure the plate was washed in cold water until sufficiently swelled, and then electrotyped, or the design was inked with printing ink, and transferred to zinc or stone, and lithographic impressions obtained.

(To be continued.)

THE PRACTICAL PRINTER IN AMERICA. XXXV.

FAILURES IN SILVERING THE PAPER.

Paper silvered too long a time.—Result: The paper will discolour very quickly, according to temperature, and the prints will have a sunken-in appearance, and with a strong bath bronzing is very plainly indicated (even when the prints are finished) in all of the slight shadows, even those under the eyebrows, the latter result being more evident in the case of the albumen paper, the former (sunken-in appearance) both in plain and albumen paper.

Paper silvered too short a time.—Result: Weak, flat prints, without any boldness, prints red, and red spots of various sizes are very noticeable. The bath is either too weak, or the paper is floated too short a time, or both when the above results appear.

Plain paper, if silvered too short a time, will act similarly to albumen, and then if it had been swabbed when this result occurs, the strength of the silver solution is too low, and should be increased.

Do not lay flat and red prints to the paper being under-silvered, unless you are sure that the paper has been thoroughly dried before and after fuming, as the same results occur by printing upon paper that has not been dried, as said before.

Bubbles on the paper while silvering.—Blow at them, or touch them gently with a glass rod.

Paper curling over while silvering.—Breathe gently (don't blow) on it, and it will flatten at once.

Greasiness to the solution on the paper after coating.—The paper was either too dry before floating, solution too cold, or the paper was floated too short a time.

Stains on the paper after silvering, and while drying.—Caused by the paper coming into contact with dirty places while you are hanging it up, by dirty hands, and stains running from the corners where the paper is suspended either by common pins, tacks, &c. Remedy: Carefulness in hanging up the paper, and by the use of spring clips.

FAILURES IN DRYING THE PAPER.

Swinging and sticking together of the paper while drying, caused by draughts.

Curling of the paper while drying can be prevented by obtaining a piece of stick as long as the lower side of the suspended paper, and nailing a spring clip at each end of

the stick; fasten it to the paper by means of the nippers when the solution on the paper has stopped dripping.

Tear drops in drying.—Absorb the drops of solution with a piece of bibulous paper, and dry thoroughly.

Place a piece of tissue-paper on the lower corners of the paper while drying.

FAILURES IN FUMING.

Insufficient fuming.—Result: Prints are red, flat, and weak. The ammonia is not strong enough, or the paper was taken from the box before it ought to have been.

Too much fuming.—Result: Prints have a disagreeable blue, and a cold, repelling (and often metallic) look to them. Remedy: fume less.

Uneven fuming.—Result: Part of the paper prints well, and other parts print flat and weak. Caused either by the curling of the paper while fuming, or by parts of the paper being covered with other sheets.

CUTTING THE PAPER FOR PRINTING.

Dirty paper.—Caused by dirty hands, shears, or by laying the paper in a dirty place.

Paper cut badly.—Caused either by carelessness or ignorance.

FAILURES IN PRINTING.

Breaking of negatives.—Caused either by carelessness, flaws in glass, curved negatives, bad cutting, printing-frames, &c., &c.

Doubles features on the prints.—Caused by the prints moving in examining them during printing.

Harsh vignettes.—Caused either by a bad wooden vignette-block, the vignetting papers or cardboard being too near the negative, and if none of the above is the cause, then by the vignette not being blended enough for the strength of the light it was printed in.

Badly shaped vignettes.—Caused by the use of a badly formed vignetting arrangement.

Medallion printing.—Badly printed crescent lines, &c. Caused by poor cut-outs and masks (i.e., background masks), and often by the wrong use of them, even if they are good.

Fancy medallion printing.—Failures in this style of printing are generally caused by not going to work rightly.

Printing in grey.—Failures in this style of printing are harsh edges. Caused by shading the figure poorly.

Bendann backgrounds.—Failures with moving backgrounds, backgrounds printing in the figures, bad taste in choosing the right style of background, &c., &c.

Blurred prints.—Caused by the paper not being in perfect contact with the negative; and then, again, it is caused by the paper being too large for the place allotted to it in the frame, by its being damp, &c.

White spots on the paper.—Caused by the bubbles being permitted to remain under the paper while it is floating, and by dirt on the negatives.

Unevenly printed shadows.—Caused by poor "doctoring" of the negatives, or by printing the negative after it is doctored in too strong a light.

Uneven printing.—Negatives being partly shaded during the printing, and when reference is made to the result of a day's batch of prints, then a great diversity of the shades of prints are meant; some being too light, and others too dark, &c.

FAILURES IN TRIMMING PRINTS.

I will not here attempt to tell how the failures may be avoided, but only to notice where these failures generally occur, and then the remedy will be obvious.

Head out too high or too low in the prints, cut too much to one side, prints cut so that the figure appears to be falling either in one direction or another, and when the figure is leaning on a chair or a table, the idea of leaning is not carried out, so that the figure will appear to be sitting

up, straight, with the arms lying on the table, merely mechanically, without conveying to the understanding of the tasteful critic any successful idea that the photographer intended to have carried out.

When a print is cut as last described, a beautiful pose is often completely spoiled, and it looks to be just exactly the opposite, as regards beauty of pose, to what it is in the negative. The young beginner can thus see how he can completely spoil the beauty of a pose by making it a mechanical, instead of an artistic one.

Besides the above, there are scores and scores of cases in which the prints are a failure when so trimmed.

FAILURES IN WASHING.

Imperfectly washed prints.—Caused by the prints lying together in the water; bad results follow such treatment of the prints.

FAILURES IN ACIDIFYING.

Spotted prints.—The acid water has either got on the prints before they were placed in the water, or they were separated imperfectly while being placed in the acid water.

Refusing to red up.—The water is too cold, the acid too weak, or the paper was fumed too long.

Blistering of the paper.—The water is either too cold or too hot.

ON THE REPRODUCTION BY PHOTOGRAPHY OF MICROSCOPIC PREPARATIONS.

BY PROF. AIME GIRARD.*

I HAD the honour of presenting to the French Photographic Society, at one of its meetings, an album of micro-photographs showing various phases in the manufacture of paper, and exhibiting fibres of various kinds, which are, now-a-days, often substituted for cotton and linen rags in paper making.

On that occasion many members expressed a desire to know more of the processes by the aid of which those illustrations were obtained, and begged me to make a communication to the Society on the subject. I feel myself highly flattered by such an invitation, but I must at once admit that the method I have employed cannot in any way be considered my own. I have discovered nothing new, neither do I wish to claim priority on any point; but I have simply followed a plan which is within reach of everybody.

As I am called upon, in my quality of teacher, as well as student, to employ the microscope almost daily, I have sought to fix definitely the images revealed to my view; and having at many times rendered services to photographic science, I bethought myself of the latter to help me in return. Photography came to my aid at once, and, thanks to her, I am now able, by means of an enlarging lantern, to place before an audience pictures of any body or material I desire to call their attention to; and I am enabled also to secure images of objects examined for my own private study.

To accomplish this I have taken care not to go out of my way to discover new methods of operating, but I have been content to choose among those already known such as appeared most suitable for my purpose, and to employ them in the manner best suited to my convenience. The apparatus I employ is before you on this table, and it consists of three essential parts: the illuminating portion, the enlarging part, and finally the photographic apparatus itself. It is very compact, as you will observe, and disposed in such a way that while preserving a long focus of about 70 centimetres, it is always under the hand of the operator, who can bring into motion any portion without assistance from a second operator.

I will first speak about the lighting arrangements. I

* Read before the French Photographic Society.

have given up sunlight altogether, and employ artificial illumination in the form of the Drummond light. Sunlight is too capricious in its nature for regular work; frequently at the moment it is required it fails, and an observation of importance is lost. Moreover, by reason of the variation in its intensity, it presents serious difficulties at times. Artificial light, on the other hand, is always ready, and it is an easy matter to obtain it always of the same intensity.

The illuminating apparatus I employ is extremely simple. I did not have it made expressly for my wants, but purchased it in the ordinary way. It is a double one, and was constructed by M. Molteni; it is fitted with two lateral tubes, one of which receives ordinary gas taken direct from the pipes or meter, and the other, the oxygen, from an india-rubber bag, which on pressing gives out a proper supply.

The two gases escape at the extremity of a tube with double envelope, and the flame ignited is of a bluish transparent nature, possessing high calorific power. The tongue of flame impinges upon a little cylinder of lime mounted upon a metal point, and can be moved on a pivot, or raised or lowered, so that the incandescence does not always take place at the same spot. In front of the lime cylinder is placed a large plano-convex lens for the purpose of concentrating upon the mirror of the apparatus the light emitted by the lime under the influence of the high temperature to which it is subjected. Nothing can be more simple than this apparatus, nothing more regular than its action.

The enlarging apparatus I employ is an ordinary microscope; there is nothing peculiar about its construction, and it serves for direct observations, as also for operating photographically. I preserve it in its vertical position; other operators prefer to employ their enlarging apparatus horizontally. I do not think that this latter is a good disposition of the apparatus, for it obliges one to place the microscopic preparations in a vertical position, and they are then subject to displacement by their gravity if contained in any sort of liquid, or may glide out of the field of observation. With a microscope with a vertical tube, however, the preparations rest in a horizontal position, and, being in perfect repose, allow of their being viewed with ease and security.

To apply the microscope to photographic work, it is sufficient, then, to place the mirror in front of the lens, which concentrates the light emitted by the incandescent lime, and at a short distance from the lens, so that the luminous pencil may be directed in such a manner as to strike the object placed under the microscope. This done, the eye-piece is removed, and by means of a little supplementary bit of apparatus (a tube formed with soldered ends of different diameters), the microscopic tube is placed in the so-called axis of the photographic apparatus.

The latter is composed of an ordinary camera elevated horizontally, and fitted at the extremity with a ground-glass, which is chosen as fine as possible, and having in front, where the lens usually is, a copper tube well centred, of about six inches diameter. The junction between the photographic apparatus and the microscope may be brought about by disposing in a vertical manner the axis itself of the microscope, and the camera and metallic tube at the end of it. But this plan has the inconvenience of distancing the operator, placed near the ground-glass, from the object, which he desires to observe and to reproduce. To overcome this, it entered my mind to give the apparatus a position analogous to that of Arnic's microscope; the focal line was broken at about a third of its length, and at the bend formed, the constructor of the apparatus, M. Nachet, fitted, with his well-known skill, a little plain mirror in silvered glass, which, placed at an angle of forty-five degrees, reflects horizontally, and without deformity upon the ground-glass of the camera the image enlarged by the microscopic object glass.

Thanks to this arrangement, the apparatus measures scarcely fifty centimetres altogether, although in reality there is a focal length of seventy centimetres. The observer, seated quietly in front of the ground-glass, may therefore move the different parts of the apparatus, modify the light, shift the object under the microscope, move the ground-glass backwards and forwards to increase or lessen the size of the enlargement, or focus the image by raising or lowering the object glass.

The enlarging may be carried to any degree desirable; thus, upon the ground glass, images may be obtained varying from four to eight centimetres in diameter, and it is, moreover, an easy matter, by changing the object glass of the microscope, to pass from one enlargement of fifteen to twenty diameters to those of 500 to 600 diameters.

In arranging this apparatus, I have tried to free myself from all complications, and to render the thing as simple as possible. And it was for this reason that I resolved more than a year ago to adopt for the processes of sensitizing and development the means of illumination afforded by the complete combustion of ordinary coal gas, mixed in the first place with saline vapour.

It will be remembered that recently, at the end of an interesting communication upon the photographic properties of the vapour of sulphur in combustion, MM. Riche et Bardy laid stress upon the advantages which the employment of this yellow light appeared to present in studios; at that time, you will recollect, I confirmed these gentlemen, stating that for a year past I had employed no other description of light. I may now add, that at the commencement of 1874 I developed for the first time in the presence of my friend, M. Davanne, an image in this way.

I have thought that you would be glad to see an experimental demonstration of the advantages of this light, and as I intend in a little while reproducing a microscopic object, I shall employ this yellow light in the sensitising and developing operations.

To employ it no special apparatus whatever is necessary, and, indeed, I use a lamp constructed by M. Dubosq for quite another purpose. It is no doubt very imperfect for the purpose of illuminating a studio, but there can be no doubt that the principle once known, our opticians will soon be able to find a better way of making the apparatus. My lamp, as it is, consists of a Bunsen burner on a foot, the flame of which burns completely, and is of a scarcely visible bluish tint; into this flame is plunged a little basket, made of fine platinum wire, in which are put a few fragments of common salt, or chloride of sodium, previously fused. The flame immediately assumes a yellowish colour, which communicates to objects around a disagreeable tint, but which is scarcely actinic at all. Its photographic properties are not, however, altogether negative. The yellow light thus produced is, indeed, not absolutely pure. It always contains, especially in the case of certain lamps, a small quantity of violet, and for this reason it is imprudent to approach too closely to the flame; by keeping at some distance (say a metre) from the light, there is no need, however, to fear its actinic power. If an operator desires to test its photographic properties, he may do so with a spectroscope, when only the double sodium line should be apparent.

M. Aimé Girard gave an experimental demonstration of the process he described to the Society. A plate was in the first place sensitised by the aid of the sodium flame; a microscopic slide was placed under the microscope, and illuminated by means of the oxyhydrogen lamp, and focussed; then, for the ground glass was substituted the dark slide containing the prepared plate, and an exposure of ten seconds was given. At the end of this time the plate was taken from the slide and developed in the ordinary way by the aid again of the sodium flame, when a picture, without fogging, was produced.

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HYPOSULPHITE IN PRINTS.

AFTER so much has been written touching hyposulphite in prints, it is surprising how little the majority of photographers know about the matter. Nine pictures out of ten, that are forwarded to us by correspondents desirous of having our opinion on the cause of certain stains and defects in the albumenized paper, we find to be injured simply by the action of hyposulphite of soda. Some take the utmost care in washing their productions, using cold and warm water alternately, and afterwards letting the prints wash in running water for a dozen hours, and then finally press them dry in a contaminated blotting-pad, which damages a whole series of photographs, one after another, in a most hopeless way. Others, we fear, from the markings upon the prints that reach us, wash thoroughly enough, but permit their assistants to handle the pictures with soiled hands, if they are not themselves guilty of such a practice. Indeed, a want of perfect cleanliness is but too often the reason of stained prints, and too much stress cannot be laid upon the necessity of washing one's hands thoroughly between every operation. It is comparatively seldom, we think, that the presence of hyposulphite in photographs is due to an imperfect washing of the latter after fixing, for the merest tyro knows that no silver print will endure many months unless it is thoroughly rinsed in several changes of water after it has passed through the various operations of production.

Even in the case of careful printers, it will occasionally happen that a batch of prints are spoilt by hyposulphite; and as the symptoms of hypo contamination are not always the same, it is often a long time before one's mind is made up as to the real nature of the enemy that has caused the destruction. If photographers would have a little more confidence in themselves, and take the trouble, as we have often advised, to have a corner of their work-room fitted up with a few simple reagents and test-tubes, they might satisfy themselves on this point as well as on many other little matters which trouble them from time to time. We do not expect that every photographer can turn himself into a full-blown analytical chemist at a moment's notice, but yet we do think that if they would handle a test-tube and spirit lamp now and then, they would be able, after a little while, to conduct most of the simple investigations they stand in need of, instead of relying upon the aid of others in the matter.

The matter of testing hyposulphite of soda in silver prints is at once an example of how much a photographer may do for himself if he will only take the trouble. There are several ways of testing for hypo, but one of the simplest and easiest, as most photographers are aware, is by means of iodide of starch. Half a dozen test-tubes of the same calibre, so that the tints of liquids of the same volume may be accurately compared, are pretty well all that is required for the experiment, and so long as the

photographer is deliberate and careful in his operations, and, above all, confident in the cleanliness of his apparatus (distilled water being always employed in rinsing for the last time), he is bound to succeed in his chemical investigation.

The best instructions that can be given, probably, are those contained in Dr. Vogel's article in our YEAR-BOOK for 1874, which, although treating of hyposulphite in Bristol boards, holds good quite as much for albumenized paper. In this he plainly shows how very little hypo, whether contained in the mount or in the silver print, is sufficient to injure the latter; but, minute as the quantity may be, it is easily detected with the blue iodide of starch. According to Davanne, the quantity of silver in a carte-de-visite print is 0.00208 of a grain, and when it is borne in mind that a seventh (or, perhaps, tenth) of this amount of hyposulphite of soda is sufficient to destroy a carte photograph, the dose of hypo contained in the damaged picture is almost infinitesimal. Of course, as Dr. Vogel points out, in testing for hypo in minute quantities it is necessary to employ a very dilute solution of iodide of starch. He dissolves one grain of iodine in twenty-five grains of alcohol to begin with, and of this solution he takes 2.5 cubic centimetres, and dilutes it further with 800 cubic centimetres of water and 100 cubic centimetres of a solution of starch made by boiling one part of starch in a hundred parts of water. His standard blue solution of iodide of starch contains $\frac{1}{1000} = 0.001$ grain of iodine.

Having prepared this solution, the operator would take three or four carte-de-visite photographs and soak them for twelve hours in a little warm distilled water, and at the end of this time the water would have absorbed any hypo that might have been in the prints. Two clean test tubes of the same diameter are taken, and into each is poured one cubic centimetre of the standard iodide of starch solution. One of the tubes is then filled up with water in which the prints have been soaked, while a precisely similar quantity of pure distilled water is added to the other tube. The tint of the two tubes is then compared, a bit of white paper being put at the back to facilitate the examination; and if there is but a trace of hyposulphite present, the tint of the liquid in this test tube will be the paler. Such a result is proof positive of the presence of hypo, but we need scarcely recommend a repetition of any experiment of value.

There is no difficulty, we may mention, in obtaining of any apparatus dealer glass vessels graduated for measuring cubic centimetres, or other minute quantities. As, now-a-days, all chemists, whether English or foreign, give their weights and measures in grammes and centimetres, it is well that photographers should be provided with these metrical standards.

FRENCH CORRESPONDENCE.

CAPTAIN ABNEY IN PARIS.—PYROXYLINE FROM ELDER PITH—A NEW COLLODION—OVAL CUTTER—PRINTING FRAMES FOR CARBON WORK—CARLOS RELVAS'S MECHANICAL PRINTS—M. DE BASTIE'S HARDENED GLASS—QUIQUERET'S DRY PROCESS.

I HAD the pleasure of presenting to the French Photographic Society on the occasion of their last meeting, on the 5th inst., Captain Abney, R.E., whom the Geographical Congress had called to Paris, and who had profited by his stay in this metropolis to visit the principal photographic studios here. I need not say that, both at the Society and elsewhere, Captain Abney, whose works are well known to us, received the most cordial reception. We hope that what he has seen here has not been without interest to him, and, so far as we are concerned, we shall always foster the best souvenirs of his too short visit.

Several matters of interest took place at the last meeting of the Society, which before the announced the acc-

members present of some specimens of *medulline* collodion, which he has manufactured from elder pith. This vegetable substance possesses all the properties of cellulose in such a state of purity that it may be considered, almost, as chemically pure cellulose. When acted upon by a mixture of nitric and sulphuric acids, it acquires all the properties of xylidine, and M. Schœffner assures us that it is preferable to that obtained from cotton, paper, &c., for the preparation of collodion; only, it is dissolved with difficulty, and this has long prevented its being employed commercially. M. Schœffner has been enabled to get over this difficulty, and has mastered the preparation of pyroxilin. The medulline collodion is very limpid and sensitive, and may, according to M. Schœffner, be kept in good condition for an indefinite period. The negative bath recommended by M. Schœffner for employment with plates coated with this collodion is of eight per cent. strength, made up with the addition of two drops of tincture of iodine. He insists that the nitrate of silver shall be dissolved at a low temperature, and the development of the plates is brought about by means of ammoniacal sulphate of iron. The formula he employs is as follows:—

Filtered water	...	1000 grammes
Methylated alcohol	...	40 drops
Alcohol	...	20 grammes
Acetic acid	...	30 "
Ammoniacal sulphate of iron	...	40 "

I will take care to keep the readers of the PHOTOGRAPHIC NEWS acquainted with the results of any experiments which shall be made with this collodion.

M. Hutinet exhibited to the members of the Society a little instrument which is said to be of American origin, but which is unknown here. It is an instrument for cutting out ovals, and is composed of a little revolving cutter placed at the end of a handle; to use it, the paper to be cut is placed on a glass plate, and a metal mask, of the same calibre as the oval required, is put above the paper, then the revolving cutter is run round the inside edge of the metal oval. Two movements permit the cutter to turn properly in the hand. The cutting is very clean, and the instrument is such that it may be employed a long time before it is worn out.

M. Liebert exhibited some new printing-frames for carbon printing in one or more tints, such as M. Lambert employs for his chromotype process. I hope to return to these frames in a subsequent letter.

M. Carlos Relvas forwarded to the Society a magnificent collection of prints obtained by the Jacobi phototype process. These novel productions were much admired, for the eminent Portuguese amateur seems to let nothing hinder him in attaining perfection by means of this new process, which he has purchased, not to work commercially, but to perfect as much as possible.

M. de la Bastie, having announced that he would favour the Society with a demonstration of certain experiments to prove the amount of resistance, both to concussion and to heat, which his hardened glass is capable, redeemed his promise on Friday last. The experiments were most interesting, and demonstrated that if hardened glass is not altogether proof against attack of any kind, it acquires a wonderful amount of solidity, which permits its substitution in many instances for earthenware, porcelain, and even metal. It only remains to discover how this glass behaves when submitted for some time to the action of light, and to what degree its physical and chemical properties are modified by the operation of case-hardening to which it has been subjected.

I received some days ago from M. Quiquerez, an amateur already well known for his interesting investigations, several very fine views, obtained evidently by means of very rapid exposures. They had been secured, according to the author, by a dry plate process of which he is the inventor. M. Quiquerez has now sent me the details of his method, of which I will give your readers a description. The process

is at the outset the same as the albumen-gallic method of M. Constant-Delessert, and the modifications made by M. Quiquerez have been for the purpose more especially of augmenting the sensitiveness of the plates, and consequently the rapidity of the operations. The preliminary film with which the well-cleaned glass plates are coated, first of all, is composed of:—

Rain-water	...	1000 grammes
Beaten albumen	...	25 "
Ammonia	...	10 "

This mixture, which can be kept a long time, should, by preference, be employed in a stale condition. The collodion should also be used under the same conditions, and should contain a large proportion of bromide of potassium. The collodion should be applied slowly, so as to give a thick and uniform film, and perfectly cover the whole surface of the glass. The dipping-bath is made up with eight or ten grammes of nitrate of silver to every hundred cubic centimetres of water, with the addition of one gramme or a gramme and a-half of glacial acetic acid. When the bath is new, it is well to add, also, a little iodide of potassium. After the plate has remained four or five minutes in the bath, it is withdrawn and washed in rain-water and then in ordinary filtered water, and afterwards covered with a preservative prepared in the manner following. A solution is made up of—

Boiling rain-water	...	150 cub. cents.
Roasted and ground coffee	...	15 grammes
Caramel	...	6 "

When this solution is cold, it is filtered, and another liquid is added, made up of—

Cold rain-water	...	100 cub. cents.
Gum-arabic	...	4 grammes
Beaten and decanted albumen	...	4 cub. cents.
Pyrogallic acid	...	1 gramme.

It is to this proportion of pyrogallic acid that M. Quiquerez attributes the rapidity of his plates. As to the albumen, it appears to him indispensable by reason of the solidity which it imparts to the film. The gum and the caramel increases the keeping qualities of the coffee, and they render, moreover, the film more permeable to the developer. The preservative is applied to the plates in the usual manner; that is to say, several applications of it are made, and the film is subsequently washed and drained. The amount of exposure to be given to these plates cannot be stated very definitely, for it varies from seconds to hours, according to the nature of the object to be reproduced and the lens used, and a number of other circumstances, as the operator knows very well, and upon these depend in great measure the beauty of the results obtained.

After exposure, the plate, without being previously washed, is plunged into a bath containing 100 cubic centimetres of rain-water and five cub. cents. of a ten per cent. solution of carbonate of ammonia. If the exposure has been well-timed, the sky and the high lights of the model are visible at once, and after a few minutes the picture appears in all its details. The plate is then withdrawn from the bath, and is carefully washed, and the development continued with pyrogallic acid solution to which a few drops of a three per cent. solution of nitrate of silver, in water, has been added.

In case the negative should not come up very well in the ammonia bath, it is placed upon a stand, and the development continued with the following solutions:—

No. 1.—Rain-water	...	100 cub. cents.
Carbonate of ammonia	...	20 grammes
No. 2.—Alcohol	...	100 cub. cents.
Pyrogallic acid	...	20 grains.

Into a developing cup is poured about forty cub. cents. of rain-water, to which is added, and thoroughly mixed—

Solution No. 1	...	20 to 30 drops
Do. No. 2	...	20 to 30 "

This mixture is poured upon the plate, and is allowed to flow to and fro over the film until the image is thoroughly developed. If necessary, the negative may be intensified by the aid of pyrogallie acid. Finally, M. Quieroz fixes his image with sulphocyanide of ammonium, using for the purpose an eighty per cent. solution of the salt.

ERNEST LACAN.

HOW TO DETECT WOOD-SPIRIT IN ALCOHOL AND ALCOHOL IN WOOD-SPIRIT.

BY MM. A. RICHE, C. BARDY, AND M. BERTHELOT.*

THE duty upon alcohol is so heavy, that many attempts are made to evade it. It seems that at the present moment it is difficult to procure alcohol which does not contain a certain amount of wood-spirit, and for this reason it is well to have an easy and certain method of analysis to show how much of the latter is really present; this MM. Riche and Bardy have furnished us with in a note addressed to the Academy of Sciences. These gentlemen say:—

We thought of obtaining a solution of the problem by means of colouring-matters differing in their tints and stability, producing ethylaniline and methylaniline by their oxidation, and this idea has ensured us perfect success. Our plan of operating, which must be carefully followed, we will proceed to describe.

Into a small flask is put ten cubic centimetres of alcohol with fifteen grammes of iodine and two grammes of red phosphorus; this is immediately distilled, and the product secured in thirty to forty cubic centimetres of water. The alcoholic iodide, precipitated at the bottom of the liquid, is separated with the aid of a funnel, which is stopped with the finger, and received into a flask containing six cub. cents. of aniline. The mixture is heated; the reaction is aided by maintaining the vessel for some minutes in warm water, the temperature being moderated by dipping into cold water if any lively ebullition takes place.

At the end of an hour, some very hot water is poured into the flask to dissolve the crystals formed, and the liquid is boiled for the space of some minutes, until the vessel contains nothing but clear liquid. An alkaline solution is added to the liquid, which sets the alkaloids at liberty in the form of an oil, which is forced into the neck of the flask by adding sufficient water.

The oxidation of the alkaloid may be realized by means of bichloride of tin, by iodine, and by chlorate of potash, or, better still, by a mixture suggested by M. Hofmann, which is formed of 100 grammes of quartz sand, 2 grammes of chloride of sodium, and 3 grammes of nitrate of copper. Ten grammes of the mixture are taken, and one cubic centimetre of the oil is allowed to flow upon it, the same being mixed by means of a glass stirring rod; this mixture is put into a test-tube of two centimetres diameter, and maintained at a temperature of 90° Cent. for eight or ten hours by means of a water bath. This operation we carry out in a very simple manner by putting the test-tubes at night into the water-bath, covered with paraffin, the temperature of which remains perfectly constant by employing the regulator of M. Schloessing. The next morning the matter is exhausted by three treatments with warm alcohol, which is thrown upon a filter and raised to a volume of 100 cubic centimetres.

Pure alcohol yields a liquid presenting a reddish tint. Alcohol containing one per cent. of methylene gives, on the other hand, a magnificent violet solution beside the former. With 2.5 per cent. of methylene the hue is of a very marked violet; the tint becoming deeper and deeper where there is five or ten per cent. of wood spirit in the alcohol.

By comparing, in tubes of the same diameter, these

liquids with others obtained by synthetic mixtures of known strength, which are carefully preserved as standards in stoppered vessels, it is easily determined not only whether wood spirit is present or not in a sample of alcohol, but also the precise amount of the former. This we have proved in many samples which we have begged from different persons, and particularly from M. Peligot, requesting mixtures which contained less than ten per cent. of methylated alcohol.

By means of calorimetric apparatus, such as are used for industrial purposes to test the blacks in a refinery, it is possible to arrive at the same result; but it may also be attained in a most trustworthy manner by making use of coloured solutions, such as are employed for tinting and printing woollen goods.

The tinting is done by adding to five cubic centimetres of the solution ninety-five cubic centimetres of water. Five centimetres of this new liquid are poured into a porcelain cup containing four hundred cubic cents. of water, placed on a warm water bath. A piece of white merino, not treated with brimstone, measuring one decimetre square, is dipped; at the end of five minutes five centimetres more are added, and, after the lapse of half-an-hour, the stuff is withdrawn, washed, and dried.

The merino remains white if there is nothing but alcohol present, and presents violet tones very unequally marked when there is 1, 2.5, 5, or 10 per cent. of methylic alcohol, which may be compared to results obtained by dipping in synthetic mixtures prepared as standards.

The simplest way of operating for anyone who has to make frequent experiments would be to prepare a standard alcohol, with ten per cent. of wood spirit, and to add gradually more and more alcohol, until the same tint has been secured.

By taking an impression of the tints, one can succeed very well. To do this five cubic centimetres of the liquid, five centimetres of water, and ten grammes of gum-water are mixed, the latter containing 500 grammes of gum in a litre of water. This mixture is applied by means of a brush to a wood block, and the colour is then printed off upon muslin by pressure. The colour is allowed to dry, and is then exposed to the action of steam for twenty minutes; placed in filter paper; finally, it is washed and dried.

At the same time that MM. Riche et Bardy brought forward this method of testing the amount of wood spirit in alcohol, M. Berthelot made known a plan for making an inverse examination, for the purpose of discovering how much pure alcohol there may be in methylated spirit. This method may be employed, either for the examination of the methylated spirit of commerce, or for testing alcoholic preparations mixed with veritable wood spirit, such as may be presented to the Customs under the name of *wood spirit*.

The process is founded upon the reactions of methylic alcohol which have been made known by MM. Dumas et Peligot. It consists in heating the suspected liquid with twice its volume of concentrated sulphuric acid. Under these conditions, methylic alcohol furnishes gaseous methylic ether, capable of being entirely absorbed by the water, or the concentrated sulphuric acid; whilst ordinary alcohol produces ethylene, a gas almost insoluble in water and in concentrated sulphuric acid—at least, so an experiment of short duration proves. Ethylene may be detected and estimated by absorbing it by bromine.

By operating with ordinary precautions, as in the analysis of gases, it is possible in this way to detect the presences of ordinary alcohol in wood spirit, even when the proportion of the former only amounts to $\frac{1}{10}$ or $\frac{1}{5}$. The acetone and the normal impurities of veritable wood spirit may furnish, in these circumstances, carbonic acid and carbonic oxide, but not ethylene.

PREPARATION AND TESTING OF CYANIDE OF POTASSIUM.

BY DR. J. ENEU LOUGHLIN.*

THE preparation of cyanide of potassium for laboratory use is well worthy of special attention. A very good quality of cyanide is made by the following process:—

1. Purification of the carbonate of potassium. Ordinary salt of tartar ranges from 72 to 96 per cent. carbonate of potassium, the remainder being chloride of potassium and sulphate of potassium. The latter salt is very objectionable in the preparation of cyanide of potassium, as it is apt to colour the cyanide from a light grey up to a reddish-brown, passing through the intermediate stage of yellowish red. All that is necessary to purify the salt of tartar is to dissolve it in its own volume of water, allow it to settle, pour off the clear liquor, and evaporate it rapidly to dryness in a clean iron crucible.

2. Recrystallisation of the ferrocyanide of potassium, and drying the same completely by exposure to a gentle heat, yields a powder which is a dirty, greyish white, with a slight tinge of yellow.

3. Preparation of the cyanide of potassium. I use an iron crucible of half-litre capacity. Place it in a furnace, and heat to a bright-red heat. The mixture of equal weights of dried ferrocyanide of potassium and carbonate of potassium is projected into the red-hot crucible, half at each projection. The mass soon melts, becomes first pasty and of a black colour, but gradually it becomes limpid, and assumes a light yellow colour; a considerable amount of gas is evolved, and the colour of the frothing is a very good index when the operation is finished. As soon as the froth is white, the operation is finished. A piece of dry, clean iron, dipped in the mass and brought out, shows the cyanide upon it to be of a pure white, if the operation was rightly performed. The heat is now slackened down a very little; the pasty mass of iron, in combination with some carbon, deposits upon the bottom, and the clear liquid cyanide of potassium is now ready for pouring. An ordinary iron pan well polished on the inside, and thoroughly cleaned from rust by dilute hydrochloric acid, and scouring with sand, serves well this purpose of a receptacle for the liquid cyanide of potassium. It should be carefully poured through a fine mesh of iron wire, avoiding the dregs of settled iron. It should also be poured so as to form thin cakes, which are conveniently broken up. As soon as the mass is sufficiently cooled it is placed in well-stoppered (glass) bottles. By this method an amount of cyanide of potassium is obtained equal to the weight of ferrocyanide of potassium used. (It is called cyanide of potassium commercially; chemically it is a mixture.) It contains from 65 to 88 per cent. cyanide of potassium; is very hard, of pure white colour, presents a partially crystalline appearance upon fracture, and is very deliquescent, evolving a perceptible odour of hydrocyanic acid. The crystalline appearance becomes more and more perceptible as the amount of cyanide of potassium in the specimen increases.

Pure cyanide of potassium can be conveniently obtained from the above by breaking up moderately fine the cyanide, packing it in a glass percolator, and allowing bisulphide of carbon to pass through it. The bisulphide takes up the cyanide, "leaving the other substances present in the commercial cyanide." The bisulphide is allowed to evaporate spontaneously, or is driven off by gentle heat. The pure cyanide of potassium is deposited as a crystalline mass, which is kept in that state; or, as I much prefer, fused and broken up. A sample of cyanide, so prepared, will range from 97 to 99.2 per cent. cyanide of potassium. It is very deliquescent, evolving considerable HCN, not as hard as the commercial, has a more or less transparent appearance, and a very distinct crystalline structure.

In order to determine the value of commercial specimens, I purchased from several of the prominent Philadelphia

manufacturers, and found the results to vary considerably. The method employed was Liebig's. A decinormal solution of nitrate of silver containing

10.797 grms. silver in 1 litre solution
 $1 \text{ CC} = 0.0054 \text{ HCN} = 0.0302 \text{ KCN}$.

This process is fully described in *Fresenius's Quantitative Analysis*, pp. 328, 329. Fifteen specimens of each were examined, the grammes being the quantity operated on. These results were further confirmed by mixing the solution containing the cyanide of potassium with excess of nitrate of silver solution, then finally nitric acid in slight excess, allowing to settle without warming, and determining the cyanide of silver by collecting the precipitate upon a previously weighed filter, and drying at 100°C . until the precipitate ceased to lose weight. The names of the manufacturers are not given, for the reason that the samples of each party were sufficiently strong to be considered good commercial articles; the range was from 56 to 88 per cent. A sample of pure French cyanide assayed 94.2 per cent. There are several reasons for the great variations in the respective amounts of cyanide of potassium in commercial specimens.

1. I have found that perfect drying of the salt of tartar and ferrocyanide insures a product of much higher percentage than if the salt of tartar or ferrocyanide, or both, were not perfectly dry. If the ferrocyanide of potassium is not added in a dry condition, a loss of at least five per cent. KCN is produced. Addition of the salt of tartar in a slightly moist state produces a loss of three per cent. KCN; and the two materials, added, in an undried condition, a loss amounting to at least twelve per cent. KCN.

2. The quicker cyanide of potassium is made, the better the product (higher the per cent. KCN); the less salt of tartar used up to a certain point, the quicker the operation is effected, the higher the per cent. KCN produced. We cannot with safety add salt of tartar beyond a certain point, or we will obtain a mixture that fuses with great difficulty, and which cannot readily be poured. If the salt of tartar or ferrocyanide contains sulphate of potassium, the resulting cyanide will be coloured from a delicate pink up to a reddish brown, according to the amount of the sulphate of potassium present. Refusion with one-third its weight of dried ferrocyanide of potassium, and one-fiftieth its weight of clean iron filings, produces a fine white product of high per centage KCN. I have obtained very good results by heating the salt of tartar in the pot to redness, and adding the dried ferrocyanide of potassium. The plan of first heating the ferrocyanide to fusion, and adding the salt of tartar, does not succeed so well. I cannot too strongly comment on the advantages of heating the pot to a red heat before the addition of the materials, or upon the drying of the materials, and thorough mixing before their projection into the pot.

Correspondence.

THE HISTORY OF CARBON PRINTING: A PROTEST.

DEAR SIR,—By virtue of your and others' kind appreciation of my labours, my name has hitherto occupied an honourable position among those of the numerous persons who have contributed to make carbon printing successful. Having joined in the purchase of Swan's English Patent, and worked it extensively, we found considerable difficulty in the manipulation of large proofs, the wet paper tearing under its own weight. I ultimately succeeded in mounting such proofs upon plates of metal and glass, and thus obtained, with ease, prints up to four by three feet.

I found that the insulated gelatine paper, when immersed in water until it had assumed its greatest extension, but had not become saturated, would adhere to such plates without the use of caoutchouc, shellac, or any cementing surface, and this with such tenacity, that it was necessary to

* *American Chemist*.

interpose some repellent substance, stearine or wax, to prevent ultimate adherence.

I took out a patent for the use of this and some other modifications of existing processes; but not before submitting the specification to you for revision and approbation. Patents were granted me in several European countries, and in America, after a most crucial examination of my pretensions. The process has been successfully practised, not only by the Autotype Company, but by Mr. Sarony, Mr. Baden Pritchard, Capt. Abney, Col. Crawford, &c. It has been adopted in Belgium, and to some extent in Germany. In France, M. Vidal, of Marseilles, has used the invention exclusively. In 1870 he published a little work calling attention to my process and the results as obtained by him and M. Tesseire; and in February, 1874, on my way to Algeria, he asked for and obtained my permission to use it for the publication of his work on photopolychromie, for which he had prepared many thousand prints.

In a pamphlet just published, purporting to be a history of carbon printing, Dr. Monckhoven takes upon himself to erase my name from the list of persons who have contributed by their labours to the progress of carbon printing; and thus, at one blow, attempts to deprive me of the reputation and honourable position which your suffrages had accorded me.

Dr. Monckhoven's qualifications for the task he has voluntarily undertaken would appear to be, that among his many unfortunate photographic speculations, always announced to the photographic public with much sound of trumpet and beating of big drum, he has never tried a single experiment or discovered a single fact worth recording on the subject in question. On the other hand, he has announced that he is about to commence a manufacture of pigment paper, and articles for the use of carbon printers in Belgium; and, as the existence of my patent there may seriously affect his commercial operations, it is obvious that he is at present more directly and personally interested in annulling that patent than probably any other man in Europe. I know this, because he applied to me through a common friend, a few weeks ago, to know if I would communicate to him the formulæ and apparatus (*moyens*) for manufacturing the autotype papers! I received an intimation about the same time that Dr. Monckhoven's means were very limited. Now, was this demand, and appeal *ad misericordiam*, made to a man whose reputation and property he was about to attack; or is the attack the consequence of my refusal?

Doctor Monckhoven as an historian is as unfortunate as he has proved to be in his photographic speculations. I venture to say that a more incomplete, garbled, and transparently unfair history, was never concocted. I might treat this pretended history with the contempt it deservedly received (as I am told) from the Société Française, who refused to receive it, treating it very properly as a trade circular; but our old proverb says, that "of mud thrown some is sure to stick," and as this is one of the dirtiest handfuls of mud ever thrown at a man's good name, I will give one specimen of Doctor Monckhoven's manner of writing history, in the hope of neutralizing some of this dirt.

Dr. Monckhoven states correctly (p. 18) that Mr. Swan, when he mounted his prints upon a permanent support, used albumen or starch; and when the former, he rendered it insoluble by means of heat or alcohol. He then proceeds to attribute to Mr. Davies (who published an article on carbon printing in 1864—"Bull. Soc. Franc." p. 273—in which reference is specially made to Swan's process) a serious and capital discovery! It is, that before mounting his exposed print upon uncoagulated, albumenized paper, he dipped the print for one minute in water, and then applied it to the albumenized surface, which he afterwards rendered insoluble by means of alcohol. Now, to carry out this process of Swan, what else could he do, but wet either paper or print, without which the colloid body would not adhere?

Had Mr. Davies known the fact I discovered subsequently, viz., that the print would adhere to the albumen even after it

had been coagulated, he would have saved his alcohol—which is tolerably expensive, even when methylated—and would have rendered his albumen insoluble by means of steam.

Dr. Monckhoven then proceeds to garble Mr. Davies' paper in a manner which I will leave your readers to qualify. I place the quotations side by side.

MONCKHOVEN.

Pour le double transport, Mons. Davies, au lieu de papier albuminé, prend un papier revêtu de gomme laque dissoute dans le méthyle. Il y fait adhérer le papier insolé, qu'il développe, et transporte alors l'image sur papier. L'image est ainsi redressée. Auquel support provisoire il tient par adhérence atmosphérique, découvert encore réclamé par M. Johnson.

DAVIES.

Si l'épreuve a été tirée après un cliché ordinaire, elle est renversée. Si on désire qu'il n'en soit pas ainsi, il faut un peu modifier la manière d'opérer. Je prends alors, au lieu de papier albuminé, une solution étendue de gomme laque et de térébenthine de Venise dans l'alcool méthylié, et je fais adhérer la surface impressionnée avec une feuille de papier ordinaire en interposant entre les deux feuilles une couche de cette solution, passant le tout à la presse, laissant sécher, et continuant, comme je l'ai dit, pour le papier albuminé. Après développement, je sature d'alcool méthylié une feuille de papier buvard ayant les mêmes dimensions que l'épreuve; je mets cette feuille en contact avec la deuxième feuille de papier, et je laisse le tout pressé entre deux glaces pendant au quart d'heure environ (to detach the print from the gum lac).

It is evident that Dr. Monckhoven leaves his readers to infer that the paper serving as a temporary support had been previously rendered impermeable by a stratum of gum lac, and that the exposed gelatine print was applied by water as in the case of the albumenized paper. But Mr. Davies says that the cement or varnish was applied as a liquid between the surfaces, which were then pressed together; and if so, we know that the gelatine print had not been wetted, or it would not have adhered, the water precipitating the resin in solution as an insoluble, inadhesive mass.

Again, if Mr. Davies knew that the sheets would adhere by atmospheric pressure, why use the liquid cement between the surfaces?

Mr. Davies' communication was made originally to the Photographic Society of Edinburgh, 6th July, 1864. I quote the French version, to show that Dr. Monckhoven's perverted history is not due to his misunderstanding the language of the original communication.

I have not the pleasure of knowing Mr. Davies, but I am sure that he will bear me out when I say that his process was a modification of Swan's, and that at that time he was unacquainted with the fact that no cement was required to hold the print upon an impermeable surface during development. I put side by side the three processes for obtaining non-inverted prints.

SWAN'S.

1st. After exposure, layer of caoutchouc between print and temporary support to effect adhesion.

2nd. Passage through press.

3rd. Development, drying, and application of second transfer paper.

4th. Application of benzoline to separate print from temporary support.

DAVIES'.

1st. After exposure, layer of solution of gum lac and Venice turpentine between print and temporary support.

2nd. Passage through press.

3rd. Development, drying, and application of second transfer paper.

4th. Application of blotting-paper soaked in alcohol to separate print from temporary support.

JOHNSON'S.

1st. After exposure, no cementing compound to effect adhesion. Thin stratum of stearine or wax to prevent ultimate adhesion.

2nd. No passage through press.

3rd. Development, drying, and application of second transfer paper.

4th. No solvent required. Print falls off when dry.

Your readers will judge by this specimen of Dr. Monckhoven's qualifications as an impartial historian. And when I tell him that I have a lawsuit pending which was expected to be tried a few weeks ago, and that this work was prepared and kept unnoticed in France, intended to be sprung upon me and produced in court to bias the judges as the report of a disinterested expert, the process of Mr. Davies having been carefully omitted from the conclusions of that in the matters to be produced by my adversaries,

they will see that Dr. Monckhoven is evidently acting in concert with, or has more probably lent his name to, the oblique with which I am contending here, and with whose proceedings I will, on some future day, amuse your readers, unless the proceedings before a well-known court, threatened by their dupes, should have forestalled me.—I am, dear sir, yours faithfully,

J. R. JOHNSON.

39, Rue Borghese, Neuilly-sur-Sein, August 16.

DRAWING PAPER FOR PHOTOGRAPHIC PORTRAITURE.

DEAR SIR,—As a subscriber to your valuable journal, perhaps you will allow me to supplement the remarks contained in your able article on the above, in your issue of the 13th of August, by calling the attention of photographers to the following, that use of drawing paper for photographic enlargements is specially adapted for stippled black chalk portraits. The paper I should recommend for this purpose is Whatman's hand-made white crayon paper. It may not be generally known to photographic artists that the probationary drawings executed by students for admission to the Royal Academy are drawn in black chalk on sheets of plain white crayon paper, stippled, but not stumped, the latter not being allowed in these competitions. Any one who has ever the opportunity of inspecting these works will readily admit that in some instances they fully equal fine engravings, as they possess great depth of light and shade, beauty of half-tones, with brilliancy and roundness. I would therefore suggest to photographers that, by adopting the use of drawing paper for enlargements, they could introduce a comparatively new branch in photography, namely, highly effective portraits in black chalk, in lieu of the old pictures in black and white water colours, which, however highly worked upon the paper ordinarily now in use, fall far short of a well-finished vigorous chalk drawing, and we should eventually see the old style of lithographic portraits entirely superseded. Those photographic gentlemen who are resident in London would do well to pay a visit at the present time to the South Kensington Museum, where, among the national competition drawings, they would see some very cleverly executed heads from the life, and figures from the antique drawing in chalk on white paper. Now if, after a negative has been taken, it is printed direct, or an enlargement is made on to drawing paper—i.e., Whatman's hand-made white crayon paper—the artist could produce exactly the same results as in the heads and figures referred to above.

There is a great deal more trouble in the production of a lithographic portrait than there is in a portrait that is first printed, and then worked up in chalk on drawing paper.

Of course, as it is remarked in your article, the use of drawing paper in place of that now generally used would be of immense advantage to artists when working in water colour, and all those shifts and expedients to which they are now obliged to resort, to make the colour adhere evenly on the albumenized surface, and to prevent the colour sinking in the salted paper, would be done away with, and highly finished drawings in water colour could be produced on all occasions, when customers desired them, with much greater facility and ease, and at the same time reflecting greater credit on the artist employed. I enclose my card, and am yours faithfully,

GEORGE CREIL HANCOCK.

LAMBERTYPE EFFECTS.

DEAR SIR,—Much has been said, pro and con, on the Lambertype patent, therefore I shall not occupy any of your valuable space in discussing it, but shall merely describe (to my thinking) one of the most simple and effectual means to secure the same effects, and, at the same time, to avoid any danger of infringement, which I have had in use for some time.

Varnish the negative with any good retouching varnish (I use Hubbard's) which will take the pencil sufficiently for all that is needful. Gum round the edges of the negative, then take some of Marion's papier vegetale, damp it, and strain over the back; when dry, it will be quite tight to work upon with the plumbago and a stump, or cotton-wool, as need be. There is, then, everything that can be wished for or required, and, with taste and skill, most artistic effects can be produced, which I prefer to those by M. Lambert's method with paper on the front, which is, I think, neither so fine nor sharp for any size under twelve by ten.

Mr. Werge's method is, no doubt, very good, but I do not think so good nor so simple as this.—Yours, truly,

AN OLD PHOTOGRAPHER.

Talk in the Studio.

CAPTAIN ABNEY, R.E.—Captain Abney was delegated to attend the *Congres Geographique* at Paris, as a representative of the scientific corps to which he belongs, the Royal Engineers. He has now returned to Chatham, and availed himself of his sojourn in Paris to make himself acquainted with the progress recently made in that capital in photographic printing processes, and more especially those relating to mechanical printing. Captain Abney promises to send us an account of such things as struck him with more particular interest.

We are glad to hear that Mr. Frank M. Good has recently returned from a five months' tour in the East. We have no doubt he has brought home with him a further addition to the fine series of photographs we have already had from his hands.

WHAT ARE OBSCENE PHOTOGRAPHS?—At the Guildhall to-day, before Mr. Alderman Owden, Levi Cohen, a foreigner, was charged with selling obscene photographs in the public streets. Mr. Baird, solicitor, appeared on behalf of the prisoner. Police-constable 741 said he saw the defendant in Sandy's Row, Whitechapel, where he had a stall on which were a large number of photographs, and he was surrounded by a crowd of boys, girls, and men. The photographs on the stall consisted principally of views of public buildings, but noticing that he had a quantity in his hand he asked to be allowed to look at them, and then saw that they were of an obscene character, consisting chiefly of photographs of nude women. Mr. Baird said the same sort of figures were exhibited at the Crystal and Alexandra Palaces, and in most of the public galleries. Mr. Alderman Owden asked what the prisoner was charging for them? The constable said he appeared to be charging any price that he could get. He heard one man say that he had paid a shilling for one. Mr. Alderman Owden said it was an extremely difficult matter to decide in these cases. Mr. Baird called the attention of the magistrate to the fact that the photographs were all copies from paintings and engravings. The prisoner, promising to desist from selling similar photographs, was discharged.—*The Globe*.

ELECTRIC PHOTOMETER.—We learn from *Dingler's Polytechnisches Journal* that Dr. Siemens has utilised some recently discovered properties of selenium in making an electric photometer. Crystalline selenium, as Lieutenant Sale has shown, conducts electricity better when illuminated than when in darkness. The selenium, as Siemens prepares it, conducts much better than previous forms, is more influenced by light, not much affected by heat rays, and its properties remain pretty constant. Its conductivity decreases on heating; that of previous varieties increased. By filling the interval of two small flat spiral wires with selenium between two leaves of mica, a photometric apparatus is produced by which very weak intensities of light can be accurately compared.—*English Mechanic*.

RECENT RESEARCHES IN ARTIFICIAL LIGHT FOR PHOTOGRAPHY.—We recently adverted to a new and brilliant light, said to be utilizable for photographic purposes, and based on the employment of binocide of nitrogen and sulphide of carbon. MM. Riche and Bady have recently conducted a series of experiments upon this and other modes of illumination, with a view of determining whether it was the carbon or the sulphur which gave to the light its photogenic properties, and as to whether it were possible to construct a lamp simpler in form and free from the danger of explosion incident to the use of the gases above named. The result of their investigations shows the following comparative statement of photogenic

power: oxyhydric and Drummond light, 1; zinc burning in oxygen, 4; magnesium lamp, 5; binoxide of nitrogen without sulphide of carbon, 6; and a jet of oxygen delivered upon sulphur, 8. From this it appears that the mixture of binoxide of nitrogen and sulphide of carbon is useless, since the simpler light last mentioned is more advantageous. The fumes of sulphurous acid arising from the latter are easily conducted away by a bell placed above the flame, communicating with the chimney of the apartment, and so producing an upward draft.—*Scientific American*.

To Correspondents.

C. A.—It opens on the 28th September, and contributions must be sent, not later than the 23rd, to 5, Pall Mall East.

W. W.—We do not know whence you have taken the cutting. The chloride of gold is evidently to be added at the time of toning, as the author says, "Then add chloride of gold sufficient for the occasion." One grain of chloride is usually deemed sufficient to tone a sheet of paper 22 by 17; and we should suppose, if this proportion were added to the solution, the latter would be ready for toning forthwith. As much as a solution would be taken as would be required to float the prints.

G. ROUTLEDGE.—The specimen of retouching you send is very good. Of course, without seeing the original it would be impossible to say how faithfully the retouching has been performed, but the result is pleasing, and free from any suspicion of harshness.

S. HICKTON.—You want to know the faults of your pictures. There is very little indeed the matter with them. If the lens were larger, and had greater diffusion of focus, the detail of the pictures would be a little improved, no doubt. That of the horse wanted a little more exposure, but it is a very fair photograph as it is; and if you had shaded the top of your lens, and used a smaller stop, the "house" picture would have been improved also.

IGNORAMUS.—The blue stains on your collodion positives after fixing are doubtless due to imperfect washing after developing and before fixing, the action of the cyanide upon the iron producing Prussian blue. Some samples of collodion require more washing than others to secure the complete removal of the solutions which have been applied to them. You must wash more thoroughly before applying the cyanide.

DR. A. A. MANTELL.—Your letter reaches us some hundreds of miles from books of reference, so that we are unable to give precise formulae of the process in question. It was first published in the PHOTOGRAPHIC NEWS about a dozen years ago by Mr. Blanchard, and we have since repeated it more than once in our YEAR-BOOK. Very oddly, it has several times since its first publication been taken up, worked, and re-described, with no recognition whatever, or at most a very slight one, to the original worker. As a moist process it is admirable; but the progress of dry plate work has to a considerable extent superseded moist preserved-plates. The preservative in question consists of a mixture of glycerine, honey, and albumen, with a little nitrate of silver solution added. After intimate mixture, the solution is placed in bright sunlight for a few days, and after filtering through kaolin, it is ready for use. The precise proportions we do not remember, but hope to give them in our next. So far as we remember, the preservative is applied to the sensitized plate without washing; the first portion being poured away, and a second portion applied, the plate being left to drain in the dark, and is then ready for use.

J. R.—You cannot do better than follow these directions in cutting and mounting your stereo-prints. Having first marked which should be the right and which the left hand picture, cut the double print in halves, and superimpose one on the other with their faces upwards, at the same time holding them up to the light, whereby one picture can be adjusted to the other with perfect accuracy; they are then cut with the usual glass shape. The prints should be transposed when mounted; yours were not.

B. P.—The use of iodine for decomposing and getting rid of fine traces of hypo in prints has already been proposed. Some time ago Dr. Vogel used it. He says: "I content myself by changing the water in the dishes four times. After this I colour the water with tincture of iodine to a wine yellow, and pour this over the prints. The first portion of the water is rapidly discoloured, because the hypo absorbs the iodine; a second and third portion of the iodine water is applied, until it is no longer discoloured; when this takes place, all the soda has been destroyed, i.e., it has been converted into harmless hyposulphite of soda ($\text{Na OS}_2\text{O}_3$).

E. WILLIAMS.—Methylal is a product of the oxidation of methylic alcohol. It is limpid, smelling like acetic acid. It is rarely met with in commerce; but we should think that Hopkin and Williams, Cross Street, Hatton Garden, would supply you.

J. WATKINS.—What you forward is evidently bromide of ammonium, although we have not tested it. You were quite right to prefer adding cadmium to your collodion. As, however, you are in the dark in regard to the nature of the "iodizer" already in the collodion, it is almost hopeless to remedy matters. It would be best to work with a fresh sample altogether. Red ripe collodion frequently acts more quickly than a freshly mixed sample, and, therefore, colour proves nothing in respect to inferiority of quality.

B. L. E.—There are no schools or institutions such as you mention. The only way would be to give your services gratuitously in some studio to begin with, and learn meanwhile. There are many simple manuals which you might study with profit, one of the best being Hardwich's; but without practical working this would avail you little. If you have any friends in the profession they might assist you in the matter.

LAMBERTY PATENT.—Several letters on this subject are necessarily excluded by the pressure on our space.

Several Correspondents in our next.

* * * The absence of the Editor from home may possibly delay answers to some queries, for which the indulgence of correspondents is asked.

METEOROLOGICAL REPORT FOR JULY.

BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven,
36 feet above sea level.

BAROMETER.				THERMOMETER.			Direction of Wind at 9 a.m.	REMARKS.
Date.	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1 29.40	29.38	29.30	62°	68°	61°	S.	Rain a.m. and p.m. Thunder, with lightning, about 5.30 p.m.	
2 29.41	29.43	29.50	64	66	53	S.	Rain a.m. Gloomy all day.	
3 29.60	29.70	29.92	58	60	53	S.W.	Rain a.m. and p.m.	
4 30.00	30.10	30.10	58	60	57	W.	Fair and sunny.	
5 30.22	30.28	30.25	62	63	57	S.S.W.	Fair and sunny. Very fine.	
6 30.25	30.22	30.20	59	63	60	S.	Fair and sunny.	
7 30.20	30.15	30.05	61	64	60	S.W.	Fair and sunny.	
8 29.90	29.87	29.70	59	66	60	S.	Fair, but gloomy.	
9 29.45	29.36	—	58	58	—	W.	Rain a.m. and p.m.	
10 29.20	29.31	29.21	56	64	56	S.W.	Rain a.m. and p.m.	
11 29.21	29.30	29.59	58	60	57	S.	Showers a.m. and p.m.	
12 29.84	29.96	30.03	56	60	60	S.	Fair, generally gloomy.	
13 30.03	30.00	29.90	60	60	54	S.	Rain p.m. Generally gloomy.	
14 29.71	29.60	29.80	56	60	66	S.W.	Rain p.m.	
15 29.60	29.32	29.70	59	64	68	W.S.W.	Rain a.m. and p.m. Stormy.	
16 29.70	29.72	29.75	56	66	58	S.	Fair, but gloomy.	
17 29.71	29.69	29.63	59	70	56	S.	Fair and sunny.	
18 29.56	29.56	29.57	66	67	60	W.	Rain p.m.	
19 29.54	29.57	29.60	62	70	62	W.	Rain a.m. and p.m.	
20 29.60	29.70	29.70	59	66	58	S.W.	Rain a.m. and p.m.	
21 29.40	29.63	29.61	60	63	60	N.W.	Fair and sunny.	
22 29.54	29.50	29.47	58	66	57	S.W.	Fair, but gloomy.	
23 29.40	29.33	29.30	56	61	55	W.	Rain a.m.	
24 29.32	29.40	29.50	56	60	53	W.	Fair, but gloomy.	
25 29.60	29.67	29.90	54	61	54	S.W.	Fair and sunny.	
26 30.00	30.10	30.15	56	60	56	S.	Fair and sunny.	
27 30.15	30.10	30.10	56	71	57	S.	Fair and sunny.	
28 30.09	30.05	30.00	67	67	64	W.	Fair, but gloomy.	
29 29.96	29.97	29.93	57	74	64	S.	A few drops of rain p.m. Gloomy.	
30 29.97	29.92	29.90	56	61	58	S.W.	Rain a.m. and p.m.	
31 29.90	29.89	29.89	54	60	56	S.S.W.	Fair and sunny.	

Summary.

	Maximum temperature observed	...	...	Mornings.	Noons.	Nights.
Minimum	ditto	...	...	56°	74°	64°
Mean	ditto	...	...	59	66	58
				57.7	64	57.3

Mean of whole	...	...	...	59.7°		
Number of fair days	...	...	...	...	...	16
Number of days on which rain fell	...	...	...	...	...	15
Fair days, sunny...	...	...	...	...	...	9
Fair days, gloomy	...	...	...	...	...	6

NOTES.—By a reference to the Meteorological Table for July 1874, given in the PHOTOGRAPHIC NEWS for August 7th, 1874, it will be noticed that the month of July, 1875, has been very much cooler than the corresponding month last year. The differences are as under:—

	Mornings.	Noons.	Nights.
Mean temperature of July 1874, in degrees warmer than corresponding month, 1875.	8.1	3.7	5.4

Several farmers in the neighbourhood have commenced cutting their wheat to-day. The crops are generally very full.

Chemical Laboratory, Braystones, Beckermere, August 25th.

The Photographic News, August 27, 1875.

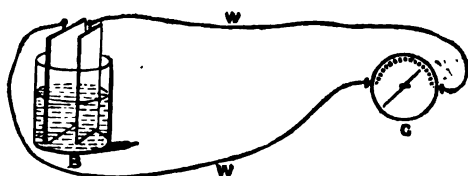
ON AN ELECTRO-PHOTOMETER.

BY E. T. ROLLS, A.S.T.E.

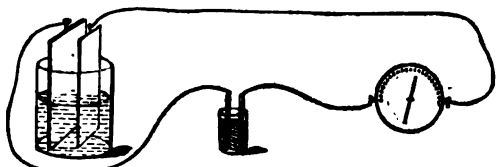
AMONG the numerous plans ventilated in the pages of this *vade mecum* for determining the power of light, attention does not appear to have been directed to what I believe will prove the *ne plus ultra* of actinometers: I refer to the peculiar behaviour of selenium under the influence of light.

Selenium, most of our friends are aware, is a substance scarcely to be termed metal or metalloid; it may be claimed by either or both classes. We need not discuss their relative rights. What concerns us, as photographers, is that selenium—quickly cooled, amorphous selenium—after being again heated for some time nearly to melting point, becomes crystalline, and conducts electricity; whereas, in its amorphous state, it will not. Further, it possesses the remarkable property of increasing its capacity of conducting electricity with the intensity of the light shining upon it, and this to such an extent that transition from darkness to the light of a common candle manifests an energetic action.

The means of determining this action and its relative force is a very simple matter indeed to electricians, and I hope may be made equally simple to those who are not. If the electric current from a galvanic battery be sent through a galvanometer, or measurer of electricity, by connecting the two with pieces of wire, the indicator needle of the galvanometer will be deflected from its zero point, the amount of deflection on a proper instrument being approximately proportional to the strength of the current.



In the above diagram, B represents a battery of a single pair of plates, zinc and copper; W the wires connecting it with the galvanometer, G. Let us suppose the needle of G, under the influence of the electric current from B, to move from its zero to 60°—that is, 60° of electricity passing through G. If we interpose a substance, such as selenium, partly resisting the passage of electricity, the deflection of the galvanometer needle will decrease in proportion to the amount of opposition offered by the selenium. The next question is how to introduce the selenium. Partly fill a short glass tube with selenium, at the same time inserting in the substance, and as far apart as possible, two thin strips of clean metal sufficiently long to protrude from the tube; then provide any form of case that will exclude light, but permit the metal strips to come through. Now join in the tube of selenium, with the battery wired, and galvanometer as here shown; and let us imagine that



with light excluded from the selenium the deflection is 10°. If we remove the case, and expose to the light of a candle, gas flame, or sunlight, the needle will, in each case, proportionately deflect. By experiment we may determine a maximum and minimum deflection produced by sunlight and candle-light; and, possessing this data, we shall thenceforth, by observing the position of the needle, be

able at any moment to judge the strength of the existing light, and, therefore, the time required to expose. In fact, so accurate does this method promise to be, that it will be possible, by experiment, to graduate the galvanometer with time seconds, and so reduce the effectiveness of exposure to a mechanical certainty, in spite of the most deceptive atmospheric conditions.

HOW TO MAKE EMULSIONS.

BY H. J. NEWTON.*

HAVING published the result of my experiments with bromide emulsions, I am receiving numerous applications for a definite description of my mode of working the formula which I have adopted. Those who are familiar with emulsion work would require nothing more than has been published; but there are many who have never tried an emulsion, and yet are desirous of being in possession of a simple and reliable dry-plate process. This class have heretofore been deterred from making dry plates by the apparent amount of labour necessary, the complex formulæ, and uncertainty of results. A number of this class have indicated a purpose to give my emulsion a trial, mainly on account of the facility with which it is prepared and used. For the benefit, therefore, of such I will give, as briefly as possible, all I deem necessary to enable any one so disposed to use it.

The first thing to be done is to make a suitable collodion. For ten ounces of collodion, use alcohol four ounces, ether six ounces; dissolve in the alcohol one hundred and twenty grains of bromide of cadmium (I have found no bromide equal to cadmium for this purpose); then put into the salted alcohol ninety grains of papyrolylin. This is much superior to any of the cottons which I have used, flowing more evenly, without having to give a long time to ripen.

After the cotton has become thoroughly saturated with the alcohol, add the ether, and shake well. To prepare the bromide, I take an ounce, place it in a small evaporating dish over a slow fire, and add half an ounce of alcohol, stir well with a glass rod until it is reduced to a white paste, and evaporate to dryness. All the care necessary in this process is to see that there is not heat sufficient to burn the salt. The silver should be fused. To make the emulsion, take three ounces of the above collodion, and fifty-four grains of the fused nitrate of silver, finely pulverized, and placed in a test tube. Then pour into a graduated glass one ounce of alcohol. Pour into a test tube one-third of this alcohol, and boil by the flame of a spirit lamp until it is saturated with the silver; then pour into the collodion, and shake violently for fifteen or twenty seconds; then add half the remaining alcohol to the silver in the tube, and proceed as before; and continue this process until the silver is all dissolved and added. The one ounce of alcohol will be sufficient. Adding the silver to the collodion should be done in the dark room, and should be protected from the light, even, from the spirit lamp. Eight or ten hours after (shaking frequently in the meantime), add twelve grains of chloride of cobalt dissolved in half an ounce of alcohol; shake well, and in two days it will be ready for use. If chloride of cobalt is not convenient, use chloride of calcium. It is not necessary to add the alcohol containing the silver a little at a time, as is usually recommended; pour in all in the test tube without stopping.

If the emulsion curdles, the curd soon dissolves, never remaining more than two hours, usually not more than fifteen minutes. The plates are prepared with a substratum of albumen. The white of one egg (or if dried albumen is used, take ninety grains) should be dissolved in eight ounces of water; then into another eight ounces of water put sixteen drops of carbolic acid. When the albumen is

dissolved, add the water containing the carbolic acid, and shake well. Albumen so prepared will keep indefinitely, and answers a much better purpose than when dissolved with ammonia; in fact, albumen with ammonia cannot be successfully used for an emulsion plate which is to be developed with alkali and pyro.

When your emulsion and plates are ready, flow the plates with the emulsion, and when set, the same as required by a collodion plate for the nitrate bath, place it into a dish containing the preservative, which is compounded as follows:—

Water	...	...	...	20 ounces
Tannin	...	...	...	20 grains.

Or the following, which gives a more sensitive plate:—

Water	...	...	...	16 ounces
Tinct. nux vomica	...	...	...	5 drachms
Laudanum	...	...	...	3 "
Alcohol	...	...	...	2 ounces.

When the tannin is dissolved, add three-fourths of an ounce of laudanum, shake well, and let stand half-an-hour, then filter out the flocculent mass, and it is ready for use. This preservative will keep indefinitely, occasional filtering only being necessary. As soon as the greasy lines are off, the plate can be removed, the back wiped with a sponge or damp cloth to facilitate the drying, and then stood on a corner on blotting-paper. It should not be set square down on the end, as the accumulation of the preservative there will keep it wet for a long time, and injure that part of the plate. Prepared in this way, they can be used before drying if required, although they are not quite as sensitive as when dry. To develop, I prepare two bottles of ammonia and water in this way: water three-fourths of an ounce, ammonia one-fourth of an ounce; into one vial I put five grains, and into the other fifteen grains bromide ammonium. If the exposure has been too long, I use from the bottle containing the fifteen grains of bromide, or mix them, as occasion requires. Second. Make a six-grain solution of pyro in water. To develop an eight by ten plate, place in a wide-mouth vial half an ounce of the pyro solution and half an ounce of water. After the plate has been well washed, flow with this solution. If the picture comes out immediately, the solution is of the proper strength. If, however, the image does not come out, increase the strength of the pyro solution. When the details of the picture are visible, which should result in about a minute and one-half, pour off the solution into a vial containing six drops of the ammonia solution, and again flow the plate. The intensity commences immediately, and goes on rapidly until sufficient strength is obtained. Wash, and fix in hypo or cyanide. If, after fixing, the negative should prove too thin, any degree of strength can be obtained as follows: Make a strong solution of iodine in water containing iodide of ammonium; into three ounces of this put half an ounce of hydrochloric acid. Into a vial containing sufficient water to flow the plate well, put enough of the iodine solution to give it a good orange colour; flow the plate with this solution for (say) one half-minute, or until a slight veil appears by reflected light, then wash and flow with a solution of pyro and tannin six grains each, acidified with acetic acid. Then pour off into a vial containing ten drops of a plain twenty-grain silver solution, and again flow the plate. The proportions of pyro and silver can be varied as the case may require. If the picture lacks detail, use less silver and a stronger pyro solution, and the reverse where there has been over-exposure.

There seems much in the above which has already been published, and therefore superfluous, but my object is the fact that I have had repeated applications for copies in this form, and have in several instances been compelled to write it out. And further, in my experience I have found some modification of former statements. For instance, when I say the chloride of

be added dry, instead of dissolved in alcohol, I find it is much better to add it in solution as given above. Plates prepared with this emulsion require no backing, as they are very opaque when dry.

I have no special pleading to make in favour of this process as compared with any other; whether A, B, or C, try it, or not, is of the utmost indifference to me. I am working in this matter neither for fame nor money. If I succeed in helping any of my fellow-photographers to produce superior negatives at a minimum outlay of labour and money, I shall feel fully compensated for the little trouble it has cost me in working and experimenting. This kind of work is to me a pleasure for which I ask no other compensation; therefore adverse notice or criticism is of no account to me, any further than it may affect those I am trying to benefit. Occupying, as I do, this position, I feel called upon to notice, briefly, some remarks of the London correspondent of the *Photographic Times*, in the July number, on my first article on emulsions, as it has come to my knowledge that several who were disposed to try the process have hesitated to do so after reading the notice alluded to. When this correspondent states that the accumulation of chloride in the preservative will, to a certain extent, destroy the sensitiveness of the film, he evidently draws his conclusions from his theory advanced in the first paragraph of his letter, that the action of a chloride and a bromide are equivalent, which is not a fact. I am hardly willing to believe so intelligent and experienced a writer ignorant of this. Suppose, however, that a large quantity of soluble chloride in the preservative would, to a limited extent, produce the effect he claims, what do the figures reveal? We will take eight ounces of emulsion for thirty plates eight by ten. In this eight ounces we have, in the first place, twenty-four grains of silver in excess; to take this up we add thirty-two grains of chloride of cobalt; about eight grains of the chloride will be used, leaving in the eight ounces about twenty-four grains of chloride in solution. The preservative consists of water twenty ounces, and alcohol two ounces, laudanum six drachms, tannin twenty grains, making in all twenty-three ounces; for convenience, we will call it twenty-four ounces.

We will have to do only with the last of the thirty plates, and will suppose all of the twenty-four grains of chloride to have been washed out of the emulsion and held now by the preservative. This would, if true, give one grain of chloride to the ounce of preservative. The plate, when taken from the preservative, retains less than one-half drachm of the solution; we will, however, call it one-half drachm, for the purpose of illustrating the absurdity of the claim of said correspondent. This will give to the last plate one-sixteenth grain of chloride, which is to be distributed over eighty square inches of surface. This will give $\frac{1}{1280}$ ths of a grain to the square inch.

Comment on these figures is unnecessary, and it will be exceedingly difficult for any intelligent reader to believe that the *Times* correspondent seriously entertained the views he has written on this subject. I have added as many as twelve grains of chloride to the ounce of emulsion, without perceptibly affecting its sensitiveness. As I stated in my first paper, I have tried most of the published formulae for making emulsions; I have washed them and dried them, and therefore know something of the amount of labour involved by the different processes, and have no hesitation in saying that this is the most simple, uniform, and satisfactory in its results of any I have ever tried.

PRA

TRAIT PHOTOG

M. HENRIWAY.

N. XV.

AND ILLUS

there is a

very diffic

or not.

the duty of the photographer to make the best of his sitter; the best in every way, especially of his face. Some persons have the gift in their intercourse with the world of being able to bring out the best qualities of those with whom they come in contact, exercising an influence over others subtle and beneficent; this rare quality is not necessary in its moral sense to the photographer, but he should have at least the ease which produces ease in others.

It is unnecessary here to speak of the rough and unmannerly specimen of humanity sometimes to be found in photographic galleries, whose every word, gesture, and action produces a discordant and worrying effect on the unfortunate sitter who has submitted himself to the tender mercies of such a boor; but even among the operators who do not come under this category are those whose unsympathetic nature does not allay, if it does not excite, a feeling of unrest which is so harmful to the picture in the expression called up by disquieting influences.

Ease of manners is not at the command of every photographer, but he can feel and express an interest and consideration in the sitter which will in most cases call forth a corresponding feeling.

There is no formula for making "expression," as there is for baths, collodion, or developer; but by observing those simple rules of kindness, courtesy, and consideration, very much may be done to set people who visit photographic galleries at their ease, and to lighten, to a considerable extent, your own trials.

With children, a great deal of tact is necessary, and the experience of paternity, which it is the author's misfortune (perhaps) never to have had, may be very useful. I do not know that I should advise any one to launch into matrimony with this object only. With children, you must possess childish sympathies; assuming it, is seldom successful; disguise your earnest intention of taking that child's portrait, and be prepared to devote a good deal of your time, if necessary. If the baby will appears to be set against your own, it is always possible to humour it into acquiescence, or, under the semblance of play, to accomplish grand and unlooked-for results. Children are our most picturesque models, and often our best friends, for through their hearts their elders are gained.

POSING.

Of the multitude who sit for photographs, only few individuals are naturally easy and graceful. There is an uncomfortable feeling in the minds of most that now they are in the posing chair they have some expression to assume. By your manner you must endeavour to make them abandon this feeling. As you converse with them, study their natural poses and facial character. Having selected in your mind the position best suited for a satisfactory picture, begin the pose. Look to the general effect, first to see that the outline is good, and in accordance with the rules of art. The head should be of easy pose and well balanced by the shoulders, not on one side (I speak of outline), giving an unstable appearance; the shoulders, bust, waist, and the dress in turn. Preserve and restore all the curves that give the oval form to the head, and destroy all the lines and angles in the dressing of the hair which have the effect of marring the natural contour. Take care that this outline stands well; that the figure and its accessories, well sustained and strengthened in every part, rest in firm and secure repose at the base, that no appearance of weakness may spoil the effect.

This secured, the rest is generally only a matter of detail—lines to be altered, balanced, or destroyed. As a broad rule, the head should turn in a different direction to the body; this gives force and character. With the three-quarter view, or approaching thereto, the head may lean a trifle on one side towards the camera (not the reverse), where force and strength are characteristic. Where the outline can be preserved it is generally well to pose the body not quite full to the camera. The line of

the arms should be curved, not angular, and where it is possible to do so, *without appearing to intend it*, the hands should be hidden. Never permit the hands and arms to obtrude themselves as objects of interest, as in a photograph they are generally quite the reverse. It must be borne in mind that the head is the principal feature, and anything detracting from its interest is an artistic fault.

Imperfections of the Face.—Every face has, artistically speaking, two sides and several views. To select the best side for a portrait, we must judge of the several features, and strike a balance between them. The following hints are, with the exceptions that govern all rules, safe to follow:—

The Hair.—Most gentlemen, and some ladies, part the hair at the side, and, there being no reason against it, that side is generally selected, except where the head is beginning to grow bald, when the other side is to be preferred.

Red hair should be powdered for ladies, as also in some cases very light hair, and relieved by a dark background. With very black hair, also, it is sometimes necessary, to prevent total loss of detail.

The Forehead.—In the case of a very high forehead, foreshorten by depression of the head.

The Eyes.—Blue and light eyes should be turned from the light, as a rule. A defective eye should of course be turned from the camera, and a profile view, if possible, should be made. Where the eyes are unequal in size or height, take the larger and higher respectively, no objection offering. Small and partially closed eyes should be made to look up, or, in a full face, depress the chin slightly, the eyes looking into the camera. Large and staring eyes should be a little lowered. Deep-set and sunken eyes require considerable front light, and very little top light.

In a full face the eyes may look into the lens, or at an object fixed near it, the body being turned away more or less; never should both body and head be presented perfectly full to the camera.

Never allow the eyes to be turned in a different direction to the head. The effect is very unpleasant. The head turning to the right, the eyes must also take that direction, and *vice versa*.

It is well to have a set of frames of different patterns, to be worn by persons in the habit of wearing glasses. Where it is necessary to photograph them with their glasses, be careful to guard against false reflections on the eyes, and refraction on the side of the cheek, seen through the glass.

The Nose is rarely perfectly straight, and often materially alters the character of the two sides of the face. The nose being twisted has the effect of shortening it on one side, and lengthening it on the other. In the case of a *nez retroussé* the head should be slightly depressed, or the camera raised and pointed down. Round and flat noses should be taken in profile.

The Cheeks.—High cheek bones and sunken cheeks should be lighted from the front, and top light avoided, or taken in profile. Wrinkles should also be lighted from the front. A swollen cheek should be avoided, or hidden by the hand.

The Mouth.—Small mouths should be taken full view, large mouths as much in profile as possible. Open mouths generally have a tightened and painful appearance when closed, but may be judiciously hidden by the hand, fan, or a flower.

The Hands when introduced are always troublesome, and should be kept back in position and tone as much as possible. When it is impossible to avoid their introduction, turn the *edges* to the camera, and carefully guard against leaning the arms too heavily against anything to distort the outline into unnatural lines or flattened unshapeliness.

It is impossible to give any very definite rules for posing, as it is an art of itself, requiring study, feeling, and a perception of the beautiful.

LIGHTING THE SITTER.

The photographer has at his command three kinds of light: direct, diffused, and reflected. Diffused light plays

the principal part in the lighting of the photographic model, but diffusion of light over the whole face would render it weak and flat, and, destroying contrast, the result would lack vigour. Opening a small portion of the side light well in front of the sitter, and perhaps a little from the top, direct light is admitted, giving roundness, boldness, and vigour to the lighting, and supplying the high lights. See that the extreme point of the nose is the lightest part of the face, a light resting on the edge of the bridge of the nose nearest the light, and that the little streak or spark in the eyes is in the same position in each. The shadow side of the face, while it is darker than the side to the light, should be full of detail, soft, and transparent. Against this light and shadow the graduated background should be placed in harmonious contrast. Reflectors of white calico are sometimes useful in lighting up heavy shadows.

THE PRACTICAL PRINTER IN AMERICA.

XXXVI.

FAILURES IN TONING.

Toning baths.—The failures in the toning bath are in the composition of it, being made up wrong, or having got some foreign substance in it that spoils the fine working of it.

Acid toning baths.—These baths will tone if only a little acid, but not so nicely as alkaline toning baths, owing to the acidity of the solution, which bleaches the prints considerably before they are toned, and thus destroys the strength and beauty of them. They also tone very much slower, as the gold is not thrown down on the prints only very slowly, as the acidity of the solution holds it in suspension. That is why we make our stock solution of gold acid, and only neutralise a part of it whenever we commence to tone, for if we were not to do this, the gold of the solution in the stock-bottle would be thrown down, and the solution would then be useless. Toning baths should always be made alkaline before use.

FAILURES IN TONING PRINTS.

When the bath is too strong (i.e., contains too much chloride of gold), the prints tone so rapidly that you cannot stop the toning quickly enough to prevent them from getting overtoned.

Uneven toning is caused by the bath being too strong, prints lying more or less together while in the bath, insufficient moving while toning, and then again by the prints not being washed sufficiently before toning, strengthening the bath while the prints are in it, &c.

Prints showing weakness in the toning bath is owing partly to the bath being too strong, and the prints being more or less weak before they were placed in the bath; and if the latter is the case, then a quick-working bath will increase this weakness.

Prints refusing to tone is due to the solution being too cold, too acid, or there not being enough gold in the solution.

Mechanical toning.—This is the name given to toning when all prints are toned alike, whether they are portraits, landscapes, machinery, drawings, &c., &c., when certain tones are best suited for each of them.

FAILURES IN FIXING PRINTS.

If the fixing-bath should be at all acid, sulphur will be liberated from the hyposulphite of soda, which will unite with the silver both in the prints and that which is in the solution, forming sulphide of silver, which will eventually be the means of spoiling the prints. To be sure that the bath will never be acid, add bicarbonate of soda to every batch of soda solution you make; and never use a bath twice, as it will cause the prints to fade, for the very reason that has been spoken of above, and the whites of the prints will discolour and be a white-yellow in colour rather than the virgin white.

Uneven fixing.—This is caused by the prints not being separated thoroughly while in the bath, and the silver consequently not being thoroughly removed.

Air-bubbles in fixing.—The bubbles continuing unbroken in the fixing bath often get between the prints, and if they are not kept in constant motion while in the bath these bubbles will cause minute spots of imperfect fixing. These spots are yellow.

If the prints are constantly kept in motion while in the bath, about all of the evil effects that have been named above will be avoided.

FAILURES IN WASHING.

Insufficient washing is a source of fading of the prints making them turn yellow in a short time.

If the prints have not been sufficiently fixed they will show it when washing, as then they will look dark and muddy when examined in a strong light. Keep the prints separated from each other while washing.

FAILURES AFTER THE FINAL WASHING.

Cards a source of fading.—It has been discussed considerably, as to whether the cards upon which the prints are mounted are a source of fading. It has been satisfactorily proved by many of our leading first-class photographers, both at home and abroad, that it is very seldom indeed that there is anything in the cards that will affect the prints.

Lately (i. e., within a year or so) the manufacturers of the card mounts have taken more pains to utterly exclude, as far as possible, all such ingredients in the manufacture of the cards that will in any way help to destroy the prints.

Owing to the blame being laid to the card-mounts as a cause of the prints fading, an eminent firm of Paris, France (M.M. Robaut & Hutinet, manufacturers of card mounts), made a fair and impartial trial, and laid the result of their experiments and researches before the French Photographic Society, which society was beyond a doubt that the card mounts are not a source of fading of the prints, but that when fading does occur it is from other causes, probably improper manipulation of the prints, &c. If the members of this society, who were in the first place prejudiced against the card mounts, all of whom are excellent photographers, are satisfied with the investigations, we also should be, and I for one am.

Now when we take into consideration that the prints, which we know are properly manipulated, do not fade for months (see experiments, page 126) under severe tests, we cannot help being satisfied that those prints were excellently made, and properly manipulated; and we do not think of such a thing as the card mounts making them fade, because they do not.

It is only when the prints fade that the mounts are said to be a source of their fading.

I know of a photographer who to my certain knowledge changed his mind no less than six times in as many months about the mounts making the prints fade, at one time saying that they did not, because the prints were "all right," and at another that they did, because they were all wrong; but there was one peculiarity in his remarks, and that was that the prints themselves never were the cause of fading, but that it was always the mounts. The reason why, was because the photographer himself did the printing, or at least I think that was the reason.

Once upon a time the printers of a certain photographic establishment were to be let off at two p.m. (it was a holiday) providing they got their work done, and, as a natural consequence, one o'clock came before they were aware of it, and so, of course, they had to "rush things" to get done at two o'clock; and when printers decide on rushing things you may depend upon it that they can do it. They got off at two p.m., of course. A few days afterwards these very prints were spotted, streaked, and of course "the condition, as acquired as man-pri

of prints that were toned on the last holiday had the usual amount of care and attention given to them that he was in the habit of giving the prints.

The printer of course said that they had, and suddenly exclaimed, as though the thought had just entered his head: "Come to think of it, I was very particular about that batch, because, as I started quite early to tone, I had plenty of time to tone them, and as I had a splendid light to tone by, I liked to see how nice I could make them come out! But why do you ask?" he innocently inquired.

The photographer then told him about the prints, and while telling him about it, he happened to think that those prints were mounted upon some new card mounts which he had received on that day, and being mystified about it, he at once laid it to the mounts, and immediately sent them back to the bewildered parties of whom he had purchased them, and as he had no more trouble with his prints he probably thinks to this day that the card mounts were poor, and most likely he is a strong advocate of the idea that card-mounts are a source of fading.

FAILURES IN FINISHING.

Colour mixed badly, absence of gum-arabic in the colour, prints rolled badly.

Encaustic paste made wrong, daubed up card mounts, ridges on the surface of the prints.

PHOTO-MECHANICAL PRINTING.

BY E. BIERSTADT.*

We now come to the invention of Alphonse Louis Poitevin, which was patented in England, December 13th, 1855. This inventor claims to have been the discoverer of the fact that a chrome-gelatine film, impressed with a picture and dampened, would receive greasy inks on the parts affected by light, although the fact must have been known to Paul Pretsch more than a year before, for he distinctly says, in his patent of 1854, that the chrome-gelatine "design was inked with printing ink," and transferred to zinc or stone. In Poitevin's process, after inking, the film was retained with the picture on it, or impressions were taken in the lithographic manner. These impressions were probably the first successful attempts at producing half-tone of which we have any record; the half-tones in these prints were fair, but not fine, and as very little was done with the process more than experimenting, it is presumed that perfection was not yet reached. Excepting the repetitions of the experiments of Poitevin, and a few others, in the direction of photo-lithography, and the well-known carbon processes in which his pigments were mixed with the gelatine, we hear nothing further of any photo-mechanical prints in half-tone until 1865, when Tessie du Motay, and Marechal, of Metz, in France, made an advance which was then considered wonderful. Their method was to coat metallic plates with gelatine, and bichromate or trichromate of potash, or ammonia, and bichloride of mercury, then again coated with soaps of silver, exposed to light through a negative, then washed, inked, and printed from in a lithographic manner.

In a paper read before the French Photographic Society in May, 1867, Tessie du Motay says: "A mixture of isinglass, gelatine, and gum, evenly spread upon a well-polished metallic surface, and previously treated with an acid chromate, has been found to give the most satisfactory results."

"The ordinary chromate and bichromate salts are not suited to the purpose, as they do not impart sufficient sensitiveness to a mass of organic matter if the latter happens to be of a notable thickness, the photographic image being insufficiently developed, and therefore imperfect; the alkaline trichromates, when used alone, are likewise incapable of producing perfect impressions, and it is only by adding a certain proportion of acid, or some body possessing a strong affinity for oxygen—as formic, gallic, pyrogallio acid,

or even certain reducing salts, as hyposulphites, sulphites, bisulphites, hypophosphites, &c., to the trichromates—that a suitable compound is obtained.

"Trichromates of potash, in conjunction with bichloride of mercury, may likewise be used, as also chromo-mercurial salts; but by these means an image is obtained which produces negative prints, so that the photograph must be inverted if it is desired to obtain positive impressions.

"When treated with a reducing salt, the trichromate, as also the chromo-mercurial salts, have the property of acting upon the composition of isinglass, gelatine, and gum, when in contact with a surface of copper, rendering that portion of the compound which comes in contact with the metal perfectly insoluble, a result which is accelerated and more completely brought about by warming the film previously to its being flowed upon the metal plate.

"After coating, the plate is exposed for several hours in an oven or stove to a temperature of 50° Centigrade; this operation is indispensable to the stability of the film, which otherwise is very liable to be injured by the scraper when the plate is passed through the lithographic press. After heating, it is ready for exposure under a negative. Plates produced in this manner are capable of furnishing about seventy good impressions.

Tessie du Motay tells us here that his gelatine and chromo-mercurial salt solution becomes "perfectly insoluble" on the surface in contact with the metal plate. But in his patent specification he says that by long washing of these plates the action of light is reversed, so that the parts exposed to light become soluble. In printing, the plates must be kept moist, which amounts to a "long washing," and of course the gelatine eventually becomes soluble. This may account for the small number of impressions he made from each plate.

Tessie du Motay exceeded all his predecessors in the quality and quantity of pictures produced from one plate, but the trouble in preparing them was too great to make the process a commercial success, yet it was tried, and several works illustrated with it, in which the half-tints were very good.

Mr. Albert had been experimenting for several years, to discover a method of making durable films upon metal and stone, and saw that it was difficult to prevent moisture, which is indispensable in printing, from penetrating through a gelatine film. The addition of various hardening or coagulating materials, such as resinous gums, alum, tannin, &c., to the solutions had been tried; but it became evident that perfect insolubility was not to be attained in this manner, for long before a sufficient quantity is added, the whole mass will coagulate and cease to be a fluid, and becomes unmanageable. He therefore abandoned the pursuit in this direction, and experimented on the plan of forming the film first, and hardening it afterwards, and found that by immersing a plate covered with a film of gelatine in a solution containing a coagulating material the hardening was much more perfect than before; but not yet satisfied, he desired the under side of the film to be perfectly impervious to moisture. At last it occurred to him, that if the action of light made chrome gelatine insoluble, why not expose the under side of the film to the light, and thus secure the desired end? This, of course, required a transparent base upon which to spread the film, but as metallic plates and lithographic stones were considered the only things strong enough to sustain the required pressure for printing, it was some time before he could avail himself of this idea. He at length prepared a film upon glass, and found the liability to breakage much less than was anticipated, and, instead of seventy impressions, he made twelve hundred from one plate.

The most perfect and durable printing plates should be perfectly non-absorbent on the under side, besides the insolubility throughout the entire film produced by coagulation.

(To be continued.)

The Photographic News.

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THE BRITISH ASSOCIATION.

THE British Association for the Advancement of Science opened its proceedings this year on Wednesday at Bristol, under the presidency of Sir John Hawkshaw. Sectional meetings will be held daily until the last day of the month, and the gathering will come to an end on September 2. This is the second time that the British Association has met at Bristol, where it was thirty-nine years ago in the infancy of the Association, or at any rate when the latter was but six years old. We can scarcely expect now-a-days to have such important scientific matters brought before the Association as was the case in those times, for not only was the cultivation of science then only just beginning to find favour with the masses, and therefore rare discoveries in chemistry and the natural sciences were rife, but there are to-day other tribunals existing before which novelties in science can more easily be brought.

In the early days of the Association there existed but comparatively few scientific societies, such bodies as the Chemical Society and several others which find a permanent home at Burlington House not being then in existence. It is due to the latter circumstance more especially, we think, that the British Association has of late years shown little animation, at any rate so far as the experimental sciences are concerned. That there have been sound papers read in the sections, and interesting discourses delivered recently, we do not wish to deny—there is a lecture on polarized light announced, by Mr. William Spottiswoode, on the present occasion, which will be no doubt well worth listening to—but, for all that, we think that the prestige of the British Association as a scientific congress is fading away. We see nothing to regret in this, because this grand institution has done a vast amount of work, and may be said to have completed the task for which it was designed. In its early days it fostered the different sciences, and its members in the various sections discussed such subjects as were brought before them. Gradually, however, its disciples became more numerous, and it was found that a meeting once a year in the sectional rooms of the British Association was insufficient for discursive purposes, and, one after another, learned societies arose. The British Association may fairly claim to be the parent of several of these societies, which have now grown into maturity, and to some extent rival the association that gave them birth. If a man discovers a fact connected with chemistry, physics, astronomy, or the like, he does not now-a-days wait for the British Association to assemble in the autumn, but he goes off at once to the Royal, the Chemical, the Astronomical, or other suitable body, and reads his paper there. Were it otherwise, the British Association could not get through its work in six months, instead of six days, and the number of sections would, moreover, require to be multiplied. Thus, if we had no societies devoted to the discussion of

photographic subjects, and were required to bring them before the Association for the Advancement of Science, we should assuredly have to demand that a special section be set apart for photographers; while at present the little that has been said on photographic matters has not in any way interfered with the mathematical and chemical sections, under which divisions photographic matters are treated.

For some years past a lament has been heard that no questions of photographic interest have been put before the British Association, but the reason of this is simply because what photographers have to say during the year is said at their own societies. The few photographic papers that have been read within the last half-dozen years at the Association have not been above the average of those discussed at meetings of the photographic societies, while certainly all the more modern discoveries and novelties that have been brought forward have been announced to the public, either through the societies or the journals. The business of the British Association consists in the main at the present day of two principal things: the addresses of the president and sectional presidents, which are reviews of the progress of science, and the reports made by various committees or individuals, which give a succinct account of work done in different branches of science. Compared to these, the papers of individual members have been, at any rate recently, of little note. Such is the business of the British Association, but its pleasures are not less important, and it is probably these, more than anything, which will keep the associations together for many years to come. The pleasant reunions of men of science which the Association brings about, and the agreeable excursions to places of interest near at hand, are, we think, the great secret of the continued success which, despite all the drawbacks it has had to contend with, the British Association for the Advancement of Science still enjoys.

RAPID FILTRATION.

THE operation of filtering is one which photographers have so frequently to carry out, that they will be glad to know how this often tedious and time-taking task may be facilitated. Dr. Fleitmann publishes in the *Zeitschrift für Analytischen Chemie* some remarks on the subject, which will therefore be especially interesting to our readers, and which are, we may remark, quite new to most chemists. The theory of filtration, the patience-test of every chemist, says Dr. Fleitmann, is not so well-known as it should be. Whilst recently it has been endeavoured to hasten the operation of filtering by means of pressure—and everybody knows how this quickens the work—another circumstance, and one of great importance, has escaped observation. It is that the quickness of filtration depends in a great measure upon the thickness of the filter through which the liquid is passed.

Whenever I ask any of my friends in the chemical world, for the first time, which filter acts better, a thick or a thin one, I receive almost without exception the reply: In the case of liquids of similar kind, a thin filter acts better than a thick one. And yet the reverse is the truth; a double filter filters nearly double as fast as a single one, and a three-fold filter again quicker than a double one. Since I gained this experience, eighteen years ago, I have seldom employed a single filter, and as a rule, in quantitative analysis, I employ above, a thin filter of Swedish paper, and below a thicker filter of ordinary filter paper. From time to time I have told other chemists of this advantageous plan of working, but from visits which I have made to various laboratories I have found that the fact is not universally known, and I therefore publish it for the benefit of those who may not be aware of the circumstance.

The explanation of this apparently paradoxical circumstance is easy on second consideration. The filtered fluid has to get through the folds of the filter, where it is doubled crosswise, and move along the walls of the glass

vessel, in order to reach the outlet tube, and it finds great resistance if the filter is thin, and when, therefore, the circular filter-canal is too narrow. The thicker the filter is, the wider is the canal through which the filtered liquid passes on its way to the outlet.

In confirmation of my statement I may give the following results. Of three precisely similar glass filters, one was fitted with a single Swedish paper, the second with a Swedish paper and underneath a piece of ordinary filter paper, and the third had also a Swedish paper, together with two thicknesses of ordinary filter paper. Through these three filters the same fluid was passed, viz., dilute chloride of iron solutions precipitated by ammonia, in such a way that the filters were kept full for the space of an hour. After this interval the liquids that had run through the filters was measured separately with the following result. The first filter during the hour had passed liquid to the amount of 278 cubic centimetres; through the second (double) filter 560 cubic centimetres had passed, and through the third (treble) as much as 642 cubic centimetres.

The advantageous character of a double filter over a single one is more marked still, as is easily explained, in the case of such precipitates which to a certain extent stop up the pores of the filter. The results I have quoted obtained with an ordinary solution and precipitate will, however, suffice to prove what I have advanced.

METALLIC MIRRORS FOR REVERSING NEGATIVES.

BY CAPT. W. DE W. ABNEY, R.E., F.C.S., ETC.

IN some photographic operations—such as taking reversed negatives, and so on—it may be convenient to use a mirror which is silvered on the face. There is a great difficulty often experienced in a tyro effecting the ordinary silvering, as so much depends on little dodges in the manipulation. A simpler plan than that usually employed is as follows:—Take a dry plate which has had an albumen substratum and preservative, expose it to light, and develop with the alkaline developer whilst so doing. This speedily blackens the plate uniformly. Density is next given with pyro and silver till it is perfectly opaque. Fix as usual, and dry. Take a small piece of cotton wool, and rub the film till it is half polished. Next take an electro-plating solution made up as follows:—Take nitrate of silver 400 grains, and dissolve in one ounce of water. Precipitate the silver with cyanide of potassium, adding just sufficient to cause no further precipitate, when another drop of the KCy solution is added. Wash well with pure water. (This gets rid of the potassium, nitrate, and other salts). Next dissolve the precipitate in strong cyanide of potassium solution, make up to eighty ounces, and filter, when it is ready for use.

Place the semi-polished plate in a jar containing this solution, making a connection with the zinc end of a Grove's or Bunsen's cell by a copper wire, and a metal clip screwed across the end of the plate. To the platinum or carbon pole of the battery attach a similar wire with a piece of metallic silver at the end (practically I have found a sixpence answer all purposes), and immerse this in the electro-plating solution, taking care it does not touch the plate. Leave the plate in twenty minutes, when a strong deposit of silver will be formed on the surface of the film. It should next be well washed, dried, and polished with putty powder, precipitated chalk, and a piece of fine chamois leather. Mirrors so made on patent plates give capital images. I have by adopting similar methods been able to produce gold and copper mirrors which for certain experiments will prove of use. It will be found that the semi-polishing of the mirror previous to immersing it in the electro-plating bath causes a better conductivity in the film than would otherwise be the case with an auro-cyanide bath. Pretty designs in silver and gold can be made by this

method. If a plate be silvered, and then a design be drawn on or transferred to it in greasy ink, and immersed in the auro-cyanide bath, on wiping away the ink the design will be found in silver on a gilt ground. A variety of pleasing combinations can be made in this way with almost any metal.

PARTIAL REPRODUCTIONS OF GROUP PICTURES.

BY E. BIEWEL.*

WHEN it is desired to reproduce from a group of persons the portrait of one only, a difficulty arises, unless the photograph of the person in question happens to be surrounded by an even background. In most cases this is not the case; but besides the portrait to be excepted there is, perhaps, another head, or a bit of furniture, or a curtain, or something else quite as difficult to get rid of. In this case nothing else remains to be done but to cover up the unlovely thing in the negative, and to take refuge in a chemical background. Every photographer knows what a miserable result is the consequence, unless the work is very skilfully performed, for in most cases a picture is produced with two definite markings round it, a dark one and a light one, which renders it very unsightly. The smooth chemical background, moreover, harmonises very badly with the coarse grain of the copy, especially when an enlargement is attempted, and for this reason, again, the result is but an indifferent one.

I manage the matter in this comparatively simple manner. After I have made as accurate a tracing of the head as possible, I cut with a sharp knife, out of a sheet of albumenized paper, tinted to a suitable degree, an opening of the size of this tracing; the tint of this paper should harmonise with that of the picture, and must not come out too dark. This mask is then stuck with thin paste over the group picture, and pressed in a half moist condition.

In reproducing the picture in the camera, it is necessary that the former should be placed in direct light, so that there are no lines from shadows. After exposure, the original is placed in a bath of water, and the mask again removed. By pressing the original in a moist state, and touching it where necessary, it may be returned in its former state.

It is well to tint several backgrounds, and choose that most appropriate to your purpose. The reproduction is vignettised in the end.

THE ELIMINATION OF ETHER AND ALCOHOL FROM THE SILVER BATH.

BY D. WINSTANLEY.

WHEN a nitrate of silver bath becomes surcharged with ether and alcohol, its rectification is generally effected either by evaporating these the more volatile ingredients, or by precipitating the silver as carbonate, and subsequently re-dissolving in dilute nitric acid. Another method, however, suggests itself—a method which should have the advantage of convenience and rapidity—and that is the *absorption* of the materials whose removal is desired. In the rectification of alcohol, quicklime is used as an absorbent of water which cannot be removed by distillation alone; and again, ether and alcohol are to a considerable extent separated from each other by aqueous washing. It appears to me that the ether and alcohol with which a bath solution becomes contaminated might be removed by the introduction of substances soluble in these menstrua, but insoluble in water, and of such substances we have an abundance. Oily and fatty substances generally, phosphorus, certain saline compounds, and some organic principles, for instance, are soluble in ether, but not in water. Alcohol, again, dissolves the vegeto-alkalies, resins, essential oils, and various other bodies, whilst gun-cotton is dissolved by a mixture of the two. The addition of these substances, it is but reasonable to suppose, would absorb the ether and

* Photographische Correspondenz.

scribed in our article on Lambertype, and *finds it admirable in results, and very easy of application.* Now, is it logically possible that Mr. Fry having worked with success Mr. Croughton's method since November, 1873, and only tried thirteen months later, December, 1874, the Lambertype, would only find out (after having been refused a license at reduced price) in July, 1875, that the two methods are one and the same?

The claim of Mr. Croughton to even the invention of covering negatives, with paper (which I never claimed) is contradicted by Messrs. Southwell, Bros., of London, who taught it to him when he was in their employ.

LAMBERT.

DEAR SIR,—It is a very poor case that requires such a cloud of words to cover its weakness. I have a very simple answer to Mons. Lambert and his friend "Crayon."

I am prepared to prove by many witnesses that I have published, and have worked commercially (in the production of my mezzotint enlargements), from Sept. 1873, the process which he patented in 1874; that I am using it at the present time; and it is for him to prove to the contrary, and stop me if I am, as he wishes it to be understood, infringing his patent. This he knows he cannot do, so he tries to cover his position by cloudy arguments and weak abuse.—Yours truly,

G. CROUGHTON.

Lowestoft, August 16th.

Sir Andrew Ague-check.—Here's the challenge, read it;

I warrant there's vinegar and pepper in't.

TWELFTH NIGHT, Act III. Scene 4.

SIR,—M. Lambert, after honouring me with nearly fifty per cent. of his criticism, thanks me for my help. I feel truly grateful for this pat on the back, and I promise not to run from him when he comes in my way, as though he were a ghoul; indeed, should it suit him, I shall have pleasure in introducing him to the members of our Society.

M. Lambert may take what comfort he likes in reference to my admission of possible ignorance of patent law; but before he airs himself thereon he should ask his interpreter to give him some illustrations of English idioms. I may add that my ignorance is shared by members of the bar, and I have given, to the satisfaction of the Society under whose notice I first brought the Lambertype, quotations from authorities affirming the views M. Lambert declares erroneous. For his especial benefit, I repeat, there is a difference between claiming a part and the combination of parts. The parts may not be original, but the combination may. In his favourite illustration, "the use of the hot blast" was not original, nor yet the anthracite coal; the originality consisted in the combination of the two. Had the parts been claimed the patent would have been invalid; and now M. Lambert will pardon me saying the use of a "semi-translucid sheet on each side of a negative" is not original on his part, and hence he cannot substantiate any claim thereto. A well-known general, before entering into a war, boasted that everything was ready, even to the last button of the gaiters. Now that M. Lambert has proof (see PHOTOGRAPHIC NEWS, page 383, 1875) that a certain gentleman uses his process (or, rather, that which M. Lambert terms his), we will see what order his (M. L.'s) war material is in—whether it be real, or only on paper. He bristles with challenges: let us see if he takes up the gauntlet thrown down. M. Lambert must pardon me again saying, the question at issue is the validity of his patent (I'll treat of the chromotype in due course), and I maintain such challenges as he offers have nothing to do with this question.

In reference to the conspiracy fund M. Lambert is also in error. A fund never is illegal, any more than a sovereign is; the object for which it is to be expended may be, the fund cannot be. In reference to the instance with which he couples Mr. Slingsby, allow me to say, that so far as M. Lambert informs (and he is my informant) such an object is not necessarily illegal.

Will M. Lambert do me the favour to say where in his specification in 1834 "the method of applying a semi-translucid sheet on each side of a negative" is described? I say it is not specified therein; M. Lambert says it is. The profession can read and judge.

To show M. Lambert I wish him well, I venture to remind him of a circumstance he appears to have overlooked, viz., that Mr. Werge's material (see NEWS, Aug. 6th) comes under the definition of a semi-translucid material.

M. Lambert says I have taken the advice of my patent agent. He appears to know more of my doings than I know myself. I am quite unacquainted with the circumstance, however. I would advise him to get his patent agent (if he is short of any better authority) to recast his advertisement that first appeared July 16th, as it certainly implies that the process cannot be worked without certain "private formulas." I now say, he has no "private formulas" necessary for the working of his (so-called) patent. Will he contradict me?

While firmly believing in the ultimate fraternity of nations, I also believe that national characteristics will long exist among them. I will point out to M. Lambert one of them. An Englishman is a man of deeds and few words. A Frenchman a man of deeds and many words. An Englishman marches to Delhi, not crying "To Delhi! to Delhi!" and never getting there. I won't draw any parallel; I love France too much. I should not have said this much had not M. Lambert said, "If Mr. Batho dares not," &c. Now, let M. Lambert contrast Mr. Croughton's admission as to the use of the Lambertype with his (M. Lambert's) reply thereto, and, henceforth, cease to boast or threaten proceedings being taken.—Sincerely yours,

W. E. BATKO.

SIR,—While so many fresh things are being introduced into the discussion, I am afraid that the real question, whether M. Lambert has really made any improvements, is likely to be forgotten. Instead of forming my own impressions by what was being written and said, I went and examined for myself. I was pleased with the specimens that I saw, and with the statements that were made, and I became a licensee. I have gone through the course of instruction, and I am very well satisfied with what has been done in my presence. I have already put some of the information into practice, and shall shortly have still more in operation. I feel, therefore, in a better position to make remarks on M. Lambert's processes than those who know them only by reading and writing about them.

I wish to say, however, that, while I am willing to pay for information that I can make useful in my business, I am as unwilling as anyone to be imposed upon by having information sold to me as new which has already appeared in print. As I now know what the Lambertype really is—having seen it worked—and, as Mr. Croughton states that he has already described it, I obtained his paper, so that I could take steps accordingly if I found things as he stated. After reading that communication, and comparing it with the knowledge that I have of the Lambertype process, I think it is only charity to suppose that Mr. Croughton did not know what he was saying when he stated that his process and M. Lambert's were the same. I do not make this remark in an offensive sense, for I feel convinced that if Mr. Croughton had had the opportunity, as I have had, of seeing M. Lambert make an enlargement, and had had explained to him the reasons for each step in the process, that he would confess, as an honourable man, that the two methods were not only not the same, but that the principles on which they were based were as different as the manipulations were. Nothing can show this better than by comparing, step by step, the means they each take to make an enlarged negative.

To begin with, Mr. Croughton makes a transparency from this original negative, using wet collodion, for reasons that he explains, in preference to carbon. M. Lambert makes a transparency from the original negatives on carbon, for reasons which he explains; these reasons are very novel—they amount to a new discovery—but are too lengthy to give here. Mr. Croughton uses the enlarging camera; M. Lambert uses the printing-frame. Mr. Croughton makes his transparency much larger than the original negative; M. Lambert makes his the

same size as the original negative. Mr. Croughton makes a dense enlarged silver transparency, by intensifying with bi-chloride of mercury; M. Lambert makes a *very thin* carbon transparency, which he does not intensify; to do this he has invented a special tissue which is not only thin, but, by intention, has but little actinic colour. In this respect he differs from others; the usual way being to use a *dense* tissue, giving great contrast of colour in the transparency. Mr. Croughton varnishes his enlarged, intensified, silver transparency with matt varnish; M. Lambert does not varnish his thin, un-enlarged carbon transparency. Mr. Croughton works upon his dense, enlarged transparency, as much as is necessary to make from it a complete printing negative; M. Lambert does no retouching whatever on his small, thin, carbon transparency. Mr. Croughton, for reasons explained, prefers to make his final enlargement by *two* steps; M. Lambert, by intention, makes his final enlargement by *one* step only. Mr. Croughton, from his dense, worked-up, enlarged, silver transparency, makes a still further enlarged negative, having strong printing power, and that, if possible, shall require no retouching; M. Lambert makes, from his thin, small, untouched, carbon transparency, a thin, weak, under-exposed negative, that is utterly useless until it is worked-up. He uses a special collodion and developer in order to secure an ultimate enlarged negative of this thin character, which alone is suitable for his process.

At this point Mr. Croughton's work is done; at this point M. Lambert's work has hardly commenced. Mr. Croughton uses the wet collodion and enlarging camera in both operations; M. Lambert only in one. Sometimes he reverses the method, and makes a collodion transparency of the ultimate size of his enlarged negative; in that case he makes his negatives in carbon by contact printing. In such a case he puts no work on his large transparency, and he adheres always to the method of securing finally, either in silver or in carbon, an exceptionally thin enlarged negative, that is, intentionally, deficient of printing power.

But Mr. Croughton further explains that he has to resort to "expedients;" for example, he says that "in elderly people the lines and texture of the face is far too marked in the enlarged negative; this can be much softened and reduced by printing through tracing paper." Mr. Croughton, therefore, for "elderly people," strains tracing paper on the face of the negative to soften and reduce "the lines and texture of the face;" M. Lambert also places translucent paper on the face of his negatives, not only on those of "elderly people," but on those of all; but he does not do it to soften the printing (for which, in consequence of its fineness, it would be utterly useless), but for quite another purpose. Mr. Croughton also puts tracing paper on the back, both to soften the printing and to "strengthen the high lights." M. Lambert puts translucent paper on the back of his negative, but neither to soften the printing—the negatives being too soft already—nor to strengthen the high lights. The high lights are always strengthened by M. Lambert *on the front*. The real reason M. Lambert puts these papers on both front and back is to enable him to give the general intensity to his negative, which in its present thin state it requires to give it printing power. These papers—*papier minérale*—are of a new material. They have a delicate grain, and a fine tooth, very different to ordinary tracing paper. On these M. Lambert works with blacklead powder and stumps chiefly. Instead of gaining intensity in his negative by precipitated silver or mercury, as Mr. Croughton and the rest of the world does, he uses blacklead; and instead of getting the requisite intensity by chemical means, he uses mechanical and artistic means. He can thus put his intensity just where he chooses. Hence the reason why he makes his negative without intensity. Instead of intensifying with silver, which in an enlarged negative would be coarse, he uses the fine blacklead powder, which prints soft and delicate. The whole value and peculiarity of M. Lambert's process depends on this principle. Mr. Croughton relies for the goodness of his negative on the work he puts on his transparency; on his ultimate negative he does not count to be required to work, except the use of the small expedients alluded to. M. Lambert relies exclusively on working on his thin negative, which, while it supplies the drawing, gives little else of printing value. Mr. Croughton uses a varnish at the back, to render transparent his tracing paper, so as to get increased depth to his shadows. M. Lambert uses no varnish, as he needs no such aid; he starts with almost bare glass for his shadows, and his translucent paper offers scarcely any obstruction to the

light. Such a negative as Mr. Croughton produces would be useless for M. Lambert to work up, being too dense; in the same way such a negative as M. Lambert produces would be useless to Mr. Croughton. In M. Lambert's case it is not retouching at all, it is building up, it is not merely modifying the negative, it is almost making it altogether by blacklead powder instead of silver. With Mr. Croughton's way a fair print could be got from his negative, without his tracing paper, a print vigorous, delicate, and with good modelling; but from M. Lambert's scarcely anything worth looking at could be obtained. It is the body of blacklead on both sides that gives the vigour to M. Lambert's prints. With him the original negative serves for little else than a sketch to work up. He always relies on at least three films to produce the final print, and I have seen so many as *five* papers used, all worked upon, and each modifying the other.

From all this—and I have by no means exhausted the points of difference—it will be seen that the two methods are very dissimilar. I am not saying which is the better; that is another question. Only those who have seen the results can judge of the immense superiority of M. Lambert's.

All this refers to the Lambertype, and I should not have said so much if I had not felt that an injustice had been done to a foreigner, through not understanding the vital difference in principle between his method and that of Mr. Croughton's in producing enlargements. But I attach more importance to other things that M. Lambert has introduced, than to even his clever way of enlarging. I am delighted with the chromotype method of permanent printing. I hope almost immediately to get rid of albumenized paper, hypo, and fading prints. The printing and tinting frames are very ingenious; by them one can not only print the portrait with a tinted margin all round—which is a great improvement—but also one's name and address or any other device all at the same time, by a simple means of mechanical registering. Negatives may also be reproduced, omitting the faults of the originals by a fresh method. But there are so many clever things that are taught that I cannot name them all. It is a mistake to suppose that there are only one or two things that M. Lambert has to communicate. To appreciate him you must see him work; no description is sufficient. There is something to learn in all directions. Besides the information, there are certain privileges that only the licensees obtain, particularly the patented printing and tinting presses, the special tissues for chromotypes, for transparencies, and contotypes, as well as the two kinds of mineral paper. There is nothing like this latter article in the market; ordinary tracing paper is not to be compared with it.

I treat the whole affair not so much as the obtaining the exclusive use of patented privileges, but as a course of instruction of how to do better work in various ways, and a supplying of special things to use, and being taught how to use them. I smile at the bother made about the patents; there is no fear of anyone doing Lambertypes or Chromotypes unless he goes to head-quarters to learn how.

Carbon has always been good for large work, but I enclose a few of my first prints in Chromotype to show the kind of *small* work that can now be turned out as permanent portraits.—Yours, &c., A LICENSEE.

[The prints enclosed by our correspondent, who is a portraitist of great eminence, are exceedingly fine, and in every way satisfactory. It is fully time that this correspondence, which has already occupied too much space, should cease. After reading the careful analysis and comparison of the methods used by Mr. Croughton and M. Lambert, it will be seen by every one that they are in many respects essentially different. Some parts of Mr. Croughton's method, occasionally used, for a special purpose, in some points resemble M. Lambert's method, but are clearly not the same. We fully endorse the remarks of "A Licensee" as to the value of a day, spent under the tuition of M. Lambert.—Ed.]

THE HISTORY OF CARBON PRINTING.

Sir,—Little versed in personal discussion, it has never been my wont to reply to impetuous attacks made upon me. But I find in the English journals an attack upon myself so calumnious, made by Mr. Johnson, that I am compelled, in spite of myself, to reply, however repugnant such a course may be to myself.

In the first place, Mr. Johnson makes me out to be a sort of merchant or dealer, citing my unfortunate photographic speculations, &c. Now the only speculations I have made in my life have been: 1, The publication of my "*Traité Général de Photographie*," a work which has passed into its sixth edition since 1855, each edition numbering three thousand copies, and which has been translated into five languages; 2, The invention in 1864 of my enlarging apparatus, which is to be found in the principal studios of the world, and which has brought me in the sum of 450,000 francs; 3, I have besides prepared collodion for photographic purposes. Beyond these, I have done nothing but published scientific papers, and made investigations with astronomical and physical apparatus.

As to the allegation of Mr. Johnson that I am possessed of slight means, that is an assertion altogether gratuitous, which should not have emanated from a writer who respects himself. I trust Mr. Johnson may have as ample means as myself.

As to the statement, moreover, that I announced myself as a manufacturer of carbon tissue, it is perfectly untrue. Mr. Johnson says there is not another man in Europe who has so much interest as I in seeing his patent fall to the ground. But every man whose eyes are not blinded with passion must see that nobody in the world can interdict a man from making carbon material, which is manufactured in France by MM. Marion, Braun, &c., and the preparation of which has been in the hands of the public ever since the Poitevin patent lapsed in 1870.

It is true that I have the intention of occupying myself with the manufacture of pigment paper, and I hope to succeed better at it than Mr. Johnson did, when he was one of the directors of the Autotype Company in London. I shall give it the more attention from the circumstance that it will be my own capital that I shall use, and not anybody else's.

As regards M. Vidal, it was that particular friend of mine who a few months ago prompted me to prepare carbon tissue. He said to me, "I have a friend, Mr. Johnson, who has been much engaged in the manufacture of carbon tissue, and if you like I will ask him to give you some of his experiences, so that you will not have so much to learn." Upon my reply in the affirmative, he wrote to Mr. Johnson, who refused. But a month afterwards I had an interview with the directors of the Autotype Company, MM. Sawyer and Bird, for the purpose of making arrangements for the establishment of a manufactory of carbon tissue on the Continent, and it was these gentlemen who gave me precise information upon the subject of the patents of Messrs. Swan, Johnson, &c.

Up to the present moment I have not made a single sheet of carbon tissue, otherwise than experimentally in the laboratory, and I have not made such announcement as that referred to by Mr. Johnson.

It was at the invitation of several Belgian photographers that I resolved to examine the history of carbon printing. What was my astonishment to find, on reading the Johnson patent, which was of enormous length, a lot of things well known before him. Now the law is very precise: if one of the points in a patent is void, the whole of the patent is void.

In May I had finished my history of carbon printing, and I went to Paris to have a chat with MM. Vidal, Franck, Davanne, Rousselon, Liebert, &c. M. Franck and M. Vidal, both friends of Mr. Johnson, can affirm that I had then all the authentic materials for this history. M. Franck conducted me to M. Liebert at Paris, and he it was who informed me that there was a case pending in the law courts between himself and Mr. Johnson. But my history of carbon printing was finished, and this disposes of the allegation of Mr. Johnson that my work was written with a certain object.

Finally, every honest reader will recognise Mr. Johnson's attempt to mutilate the text of my pamphlet, upon which,

I may state in parenthesis, encomiums have been passed by many who do not regard it as a commercial puff.

Mr. Johnson, in the two columns, one headed Davies and the other Monckhoven, has so mutilated or perverted my words, that no one will object to my adding the lines which were omitted: This is what I say of the Davies process, if you will be good enough, Mr. Editor, to translate it into English.

"MR. DAVIES' PROCESS."

"This process, published the 5th of August, 1864, contains a serious and capital discovery, to which attention has not been sufficiently called. Mr. Davies prepares the pigment paper, sensitises, and exposes according to the known methods. But what is remarkable in his manner of developing is, that on its exit from the printing-frame he plunges the pigmented and exposed tissue into water for the space of one minute only, presses it to remove the excess of water, then makes it adhere to a sheet of albumenized paper, presses the whole by means of a roller, preventing the formation of the smallest air-bubble between the surfaces. Then the back of the albumenized paper is moistened with alcohol, which renders the albumen insoluble; it is dried and plunged into warm water, when the development is easily brought about. The paper detaches itself from the gelatinous mixture, and the image remains attached to the albumenized paper.

"For double transfer, Mr. Davies takes, in lieu of albumenized material, paper covered with *shellac*, dissolved in methylated spirit. (We underline the word *shellac* because this substance was patented several years after by Mr. Johnson.) He makes the exposed tissue adhere, and develops and transfers the image to paper. The image is thus re-dressed.

"It will be seen that the process of M. Davies (not patented) is much simpler than Swan's method. But what especially characterises it is the circumstance of plunging the pigment paper but for a minute only in water, and attaching it to the albumenized paper, to which it adheres by *atmospheric pressure*, a discovery also claimed by Mr. Johnson. In fact, the tissue plunged but for a few minutes in water is not saturated with it, however much liquid there may be. It continues to absorb under the film above, and thus ensures suction and a vacuum, which makes it adhere to the insoluble albumen film. This fact is of great practical importance."

I may add that this history of carbon printing has received the approbation of all those who have read it, and I have in my hands a series of letters from the principal photographic authorities on this subject.

I will here terminate my answer to the irascible Mr. Johnson by saying that, as he knows, I have the honour to number among my friends all whom the photographic world acknowledges to be of eminence, and till now I have enjoyed universal esteem. His impassioned attacks will not take from me one atom of that regard.

I regret, on Mr. Johnson's account, that he has so far forgotten himself as a writer as to fill his protest with a series of personalities with which the public have nothing to do, and in which I have not set the example. My history of carbon printing is written, I believe, with dignity, and is based upon a series of authentic facts.

If I am in error on a few points, I am willing to admit it; it would have been better for Mr. Johnson to have corrected me quietly.

I may remark that I shall not trouble to make any other answer to Mr. Johnson, whatever may be the nature of his attack. If he publishes it in the journals of my own country the law will see that I have justice done me; unfortunately I have not this protection in England, and this circumstance renders Mr. Johnson's attack upon me unworthy of a gentleman. I count upon the honour of the English journals to publish this reply, as they did Mr. Johnson's protest.—I am, sir, &c.,

August 22nd

DR. D. VAN MONCKHOVEN.

and then they are plunged into the bath to harden them. If the glass is too hot before its immersion in the oil, the shape of the object is injured; and if not heated enough, the object breaks. The case-hardening or immersion in oil exercises a mechanical action. The great difference in temperature which exists between the furnace and a bath brings about a different closing together of the molecules to that existing in ordinary glass. M. de la Bastie made known several of the difficulties which it was necessary to combat to solve the problem before him. They were numerous, and required much perseverance and ingenuity on his part to overcome; he has succeeded, as we have said, in considerably increasing its solidity and strength.

I will now describe some of the experiments which were made before the members of the Society at the meeting of the 6th August. Some very thin plates of glass were allowed to fall from a height of two metres, and fell upon the floor without breaking, and objects were thrown down, and seen to rebound visibly. Lamp glasses put horizontally into a flame, and then thrown down, failed to break. The lecturer then took two plates of glass of the same thickness (about five centimetres), the one of case-hardened glass, and the other of the ordinary material, and these were placed upon a kind of frame, which raised them from the floor; then a metal weight of a hundred grammes was allowed to fall upon them. The one of ordinary glass broke into fragments at the shock of the metal, falling a distance of thirty-three centimetres, while the hardened material failed to break, even when the weight fell through a distance of four metres or more.

A dish of hardened glass, placed above a spirit lamp and filled with water, was thrown upon the floor the moment the water began to boil, and did not suffer in the least. A dish of the same kind, but empty, may be left over a gas flame without breaking. Such results as these deserve serious attention, especially on the part of photographers, whose laboratories include much perishable apparatus; and they will therefore await with anxiety the action of manufacturers in the matter.

From want of space, I did not mention in my last letter the interesting communication which M. J. Rodriguez made to the Society. M. Rodriguez is Professor of Chemistry at the Lisbon Polytechnic School, and member of the Academy of Sciences of Portugal, by which government he is charged with the development of geological and geographical knowledge. Already he has been able to reproduce by printing in greasy ink a vast number of plans and maps of great scientific interest. Specimens of his work were to be seen at the Photographic Exhibition of last year, but since then the eminent professor has modified and perfected his processes in such a way that he is enabled to reproduce half-tone photographs, as well as those in black and white only. It is the old method of the two Niepces that Professor Rodriguez employs, which involves the use of bitumen of Judaea dissolved in essence of lavender and benzole. After insolation, the image is developed by means of essence of turpentine, which dissolves all the unaltered parts. Finally, by means of acid, he etches upon zinc in a very perfect manner. When it is a question of reproducing half tints (say in photographs from nature) M. Rodriguez mixes with his film of bitumen a glutinous body—such as sugar, or milk, for instance—which, coagulating in the film, gives the necessary grain. M. R. has given us some very interesting details about his photo-mechanical printing establishment at Lisbon, showing what importance is attached to photography by the Portuguese government, and the assistance it can render in many ways.

In an excursion which I recently made upon the coast of Normandy, I visited a little out-of-the-way village in this picturesque country called Veules. Descending a steep street shaded by big trees towards the quay, I met a gentleman bearing in his hands a box and tripod which I immediately recognised as photographic apparatus; and

what was my astonishment at finding that the bearer of them was my old friend M. Franck de Villecholle, the well-known and able photographer, who was travelling with a view to adding to his stock of negatives. I accompanied him on his walk, and had the pleasure of seeing him use M. Jonte's ingenious dry plate apparatus, of which I have already given your readers a description.

The dry plates used by M. Franck were prepared before his departure from Paris by a process which I have already mentioned, and which is one of his own. I can bear testimony to the fact that the views taken were secured with a pose varying from five to fifteen seconds, the light, which had been very fine to begin with, becoming dull towards evening. It is certain that with such plates and such an instrument photography is no more than a pastime, and may be practised by all the world. ERNEST LACAN.

ON THE RATIO OF THE ACTINIC POWER TO THE ILLUMINATING POWER OF MAGNETO-ELECTRIC MACHINES.

BY CAPTAIN ABNEY, R.E., F.R.A.S., ETC.

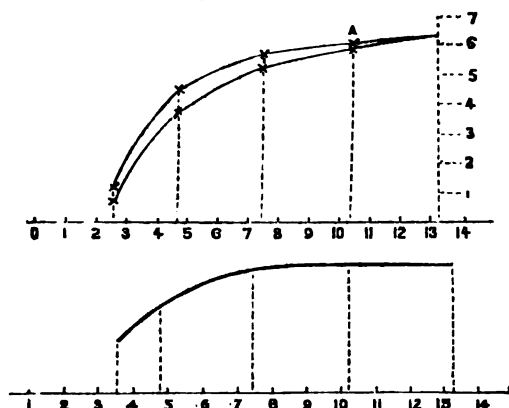
HAVING been called upon by the War Office to undertake the photometric measurements of certain magneto-electric lights, I determined to carry out actinic measurements of their value at the same time, believing that the eye-observations would be closely checked by such an independent method. In the first comparison of the results obtained by both kinds of measurement, I found a considerable discrepancy occurred in the values given to the different lights. The photographic records could not err, unless through gross carelessness in the chemical preparations, and against this every precaution had been taken. I was therefore inclined to throw blame on the eye observations. A more critical examination convinced me, however, that both were correct; that though the curves obtained for the value of the lights did not coincide, yet that they did act as a check one upon the other. In all there were six different machines to examine. Each one was driven by a ten-horse power engine. Several were driven at varying speeds, that the difference in the light caused by the variation might be tested. It was thus valuable data were acquired which I hope may prove of further scientific use.

The eye observations were made with a little instrument which I have called a diaphanometric, described in Monthly Notices of the Royal Astronomical Society of June of this year. The principle of the instrument is "the employment of moveable black glass wedges to reduce the power of the light to be measured, which light passes through the bottom half of a slit. Through the top half of a slip the light of comparison is thrown by means of a prism of total reflection. This light can also be reduced by means of similar dark glass wedges. The results obtained by this instrument have been uniform, and I had the greatest confidence in its accuracy.

The method adopted of registering the actinic power of the light was by exposing uniformly sensitive chloride of silver paper to the action of its rays. Two registrations were carried out with each light: 1st, paper was exposed to the naked light at a fixed distance from the carbon points for three minutes; and, 2nd, a strip of the same paper was exposed beneath black wedges of slight taper for sixteen minutes. The eye observations were carried on simultaneously, with the latter exposure of the sensitive paper, in both cases obtaining an integration, as it were, of the light during that period. Between ten to twenty eye observations were taken for each light, at the beginning, middle, and end of each trial. Diagrams of the steam pressure were taken in the usual manner. Diagrams were also taken of the steam pressure, when driving the machine without exciting a current, at the same speed as that at which it was

produced. They were also taken in many cases when the machines were what we may call short circuited. The data were thus obtained for calculating the power necessary to produce a light of a certain value. As various machines which are in the market were under consideration, I am precluded from giving the results of any particular form.

The upper diagram gives the mean of the results of a



series of experiments with one instrument: the top curve, deduced from eighty readings, gives what I may call the optical value; the lower curve, taken from four hundred and fifty readings, gives the actinic value; whilst the bottom diagram shows the ratio of the actinic to the optic value. In both diagrams the abscissæ are measures of the horse-power. The weakest part of the curve is about A, where it seems to be slightly deficient in convexity. The curves are instructive, showing the rapid decrease of the optical value, and still more of the actinic value, of the light when worked with low motive power. They also show that each machine has a point beyond which the increase in motive power is not compensated for by increase in light, the curves apparently becoming asymptotic.

I was not at all prepared for the great diminution of the value of actinic power in the lights, though I expected it in a smaller degree. The early experiments of Draper and others have shown that with increase of temperature the more refrangible portions of the spectrum appear after the least refrangible, but I know of no measurements which would have been applicable to the present set of experiments. The curves must evidently be some junction of the wave-lengths, and I hope to carry out other experiments in fixed portions of the spectrum, in order to ascertain if the formula which I think should hold good can be employed.

ON NITRITE OF SILVER.

BY J. W. GATEHOUSE.*

THE following experiments were undertaken in consequence of having been, during this last season, applied to several times by photographers to investigate for them the reason of a certain deteriorating action, termed by them "wooliness," to which they found their nitrate of silver sensitizing baths exposed. Having noticed in several of these cases the presence of *nitrite of silver* in the bath, it appeared advisable to investigate the properties and mode of production of this silver salt more fully than it yet appears to have been done.

As regards its formation, this may be accomplished in various ways, by many reducing agents from nitrate of silver:—

1. By precipitation with the nitrite of an alkali.
2. By the long-continued action of certain organic salts,

such as are found in the nitrate of silver photographic baths.

3. By fusion of nitrate of silver with organic matters.

4. During the electrolysis of nitrate of silver solutions.

5. By the precipitation of silver from neutral solutions of the nitrate by means of certain metals.

I propose to investigate these various methods *seriatim*, noticing under each head any peculiarities which may present themselves.

First.—When nitrite of potash is added to a neutral solution of nitrate of silver, a dense, yellowish-white precipitate soon settles down, which, viewed under the microscope, is seen to consist of aggregations of needle-shaped crystals, slowly changing colour on exposure to light, and ultimately becoming black. This precipitate is soluble both in nitric acid and ammonia, in the former of which it suffers decomposition, being reconverted into nitrate of silver. The ammoniacal solution deposits crystals of a beautiful fern-like form. The precipitate is slightly soluble in cold and largely soluble in boiling water, the solution depositing as it cools long, rectangular, needle-shaped crystals of a beautiful golden-yellow colour.

Second.—Nitrite of silver appears to be produced under certain circumstances such as those found during the sensitizing of collodionised plates in photographic manipulations, the amount actually produced being always very trifling; but by the evaporation of the bath to dryness the organic matters present frequently reduced large quantities of the nitrate of silver to the state of nitrite. Whether the nitrite of silver is the cause of the deterioration of the bath has not yet been determined.

Third.—When pure nitrate of silver is fused, and the temperature raised much above the point of fusion, this salt is converted into metallic silver without formation of nitrite; but should organic matter be present, nitrite of silver is invariably produced. One hundred grains of nitrate of silver having been carefully fused, and 2.28 grains of starch cautiously added, 4.4 grains of metallic silver were produced, together with 2.11 grains of nitrite of silver, the latter being estimated from the nitrous acid found after precipitation of the silver with ammonium chloride, and estimation with permanganate of potash. This estimation was effected by adding a large quantity of water to the precipitated solution, which was then decanted, rendered slightly acid with pure sulphuric acid, free from the oxides of nitrogen, and then titrated with a solution of permanganate of potash containing seventy-nine grains per litre, each cubic centimetre of which corresponded to 0.475 grains of N_2O_5 .

Fourth.—During the electrolysis of concentrated solutions of nitrate of silver, using platinum electrodes, metallic silver is deposited on the negative, whilst a black crystalline deposit adheres to the positive pole. After the action has proceeded for some time, these crystals become surrounded with a yellowish-brown solution, and as this increases the formation of the crystals diminishes, they becoming ultimately replaced by a black powder, which falls to the bottom of the vessel. These crystals—stated by Fownes (tenth edition) to consist of silver dioxide, and by Böttger to be peroxide of silver—are decomposed at a temperature of $50^\circ C.$, yield oxygen when treated with concentrated sulphuric acid, and chlorine with hydrochloric acid. After being dried at $100^\circ C.$, they consist of silver dioxide 8.73; grains of the crystals dried at $100^\circ C.$ yielded 7.58 grains of silver, leaving 1.15 grains to be accounted for. Considering the whole of this to be oxygen, these numbers agree well with the formula Ag_2O_3 ; but as the crystals suffer decomposition at temperatures above $50^\circ C.$, this cannot be considered to be their composition at the time of formation. 2.42 grains carefully dried at a temperature below $50^\circ C.$ yielded 1.98 grains of metallic silver, leaving .44 grains to be accounted for; and if we consider the whole of the gas

* Read before the British Association, Section B.

evolved to be pure oxygen, this approximates very closely to the formula Ag_2O_3 , or a true peroxide of silver.

It is thus easy to conceive that if this represents the true constitution of these crystals they would be readily decomposed, even at moderate temperatures, evolving pure oxygen, and leaving dioxide of silver. That this is not the case is evidenced by an analysis of the gas evolved on heating. This was effected by placing 7.1 grains of the crystals at the bottom of a porcelain crucible containing pure boiled water free from air, and inverting over them a graduated tube, also containing pure water, and applying a gentle heat. When the temperature reached 45°C . the crystals commenced to be decomposed; at 50°C , all gas having been discharged, the apparatus was allowed to cool, after which 9.9 cubic centimetres of gas were found in the graduated tube, which by endiometric analysis was found to consist of 8.76 cubic centimetres of O , and 1.14 cubic centimetres of N , giving 88.48 per cent of oxygen and 11.52 of nitrogen. Another determination of the gas from a fresh crop of crystals gave 88.1 per cent. of O .

These crystals, when heated in a hard glass tube, evolved the higher oxides of nitrogen. A direct experiment, made by heating 1.645 grains of crystals, and passing the evolved gas into water in which the amount of nitrous acid was estimated, gave—

Silver	...	...	...	...	1.825
N O_2	...	...	...	...	.0345
Oxygen by loss	...	...	...	...	.2855

1.645

which would give an approximate formula of $8(\text{Ag}_2\text{O}_3)\text{N}_2$. These crystals, therefore, appear always to contain the higher oxides of nitrogen, and as their form is similar to that of nitrite of silver it appears not improbable that during the electrolysis of nitrate of silver the nitrite is first formed on the positive pole, and this being decomposed is changed into peroxide of silver, which, however, preserves the form of the nitrite, and is always contaminated therewith. The relative amounts of silver and peroxide produced vary with the state of the solution.

Two experiments gave—

I. Silver	...	18.4	Peroxide	...	10.7
II. "	...	17.7	"	...	12.27

The fifth method of producing nitrite of silver is by means of metals and other reducing agents placed in neutral solutions of the nitrate. The solution used contained ten per cent. of nitrate silver. The metal having been placed in this the action was allowed to proceed till a fair amount of silver had been deposited. It was then decanted, the unreduced silver salts precipitated with ammonium chloride, and after decanting from the argentic chloride formed, the presence of nitrous acid was detected by means of a slightly acid solution of a mixture of potassium, iodide, and starch. Where nitrous acid had been produced it was rendered manifest by the immediate production of a deep blue colour, but where no nitrous acid had been formed the mixture remained perfectly colourless.

Experimenting in this manner it appeared that of the metals which produced a reducing action K , Na , Bi , Hg , As , and Th did not produce nitrites, whilst nitrous acid was found in greater or less quantity by the action of Fe , Ni , Co , Mg , Ti , Cu , Cb , Sn , and Sb . Now these metals divide themselves into two great groups of perissads and artiads—the latter metals so decomposing nitrate of silver as to produce nitrite; the former not doing so, but at once producing metallic silver without the intervention of any intermediate reducing action, thus indicating a radical difference in the action of these two classes of metals. The only metals whose action it is particularly desirable to notice, and which apparently depart from the true mode of action which might be expected from their atomicity, are mercury and antimony. The action of mercury, how-

ever, was such that a mercurous salt was produced, and therefore it actually took the place of a monotonic instead of a diatomic element.

With respect to antimony, it is possible that the nitrite was formed by means of the trace of iron the antimony contained, but this is scarcely admissible on account of the very minute quantity present; or it may be that antimony, although apparently pentatomic or inatomic, is in reality either tetratomic or hexatomic, following in this respect the example of iron. The two metals which produced the smallest amount of nitrite were nickel and tin. The formation of nitrous acid was, however, unmistakable in each case. The action of tin was also peculiar from producing a large quantity of a deep brownish-black powder.

With respect to the action of other reducing agents, gallic acid and phosphorus reduced the silver without production of nitrite, whilst suboxide of copper produced a decided amount.

It has been shown by Dr. Gladstone, in 1872, that this latter substance reduces nitrate of silver in a peculiar physical manner, the silver being deposited in long filamentous threads; and it was also shown by the same chemist, in 1871, that the strength of the nitrate of silver solution modified to some extent the physical appearance of the reduced silver, when accomplished by means of copper, the weaker the solution, the more thread-like being the silver.

With respect to the physical appearance of the silver deposit as seen through the microscope under powers varying from fifty to two hundred and fifty diameters, nickel and antimony produce threads of silver having a very near approach to the true filamentous condition; indeed, in the decomposition of a few cubic centimetres of solution by means of nickel in a tube, where the action takes some days to manifest itself to any extent, threads of metallic silver grew up from the bottom of the tube extending gradually to the surface, and there spreading out in beautiful fern-like forms. Bismuth, on the other hand, reduced the silver in decidedly nodular crystals.

If, now, instead of using nitrate of silver for these reductions, the nitrite be taken, then, with those substances which before reduced the silver in a filamentous form, that character becomes still more apparent; where before we had only thick threads and numerous branching spikelets approaching the filamentous character, we have now true filaments, and even, as in the case of bismuth, where, before, all was nodular and decidedly crystalline. Some filaments appear ending in tufts or spikelets, and mixed with many thicker threads springing across the field of view. Indeed, by examining the whole series of reductions from the case in which only black or nodular masses of silver are produced, to that in which the metal is deposited in a truly filamentous form, it is impossible to draw a line between the one state and the other, the change being so gradual that no decided break occurs in the gradation. It thus becomes evident that nitrite of silver has some share in the formation of this filamentous character, crystals of nitrite being first formed, then these elongate by addition of other crystals, and are, at the same time, changed into thread-like forms of pure silver. Nitrate of silver itself can, indeed, by careful heating, be reduced to long threads of metallic silver.

With respect to the solubility of nitrite of silver in water: 105.79 grains of a saturated solution being taken, and evaporated to dryness at 100°C ., .1 grain of solid nitrite of silver remained, showing it to be soluble in about 1058 times its own weight of cold water. The great ease and purity with which, from this solution, it would be possible to prepare very dilute solutions of sodium or potassium nitrite of known strength would suggest the use of nitrite of silver in the preparation of standard comparison solutions to be used in the estimation of nitrites in potable waters. The salt may readily be dried at 100°C .,

but should be kept from the light. To test the action of heat upon it a tube with nitrite of silver, weighing together 106.98 grains, was heated for two hours at 100° C. without loss of weight. During four hours more, the temperature being gradually increased to 115°, it also suffered no decomposition; the temperature was then kept at 145° C. for one hour, and now decomposition commenced, the tube and contents ultimately weighing 106.86 grains, having lost altogether .07 grains, there having been .63 grains in the tube originally! The nitrous acid lost was thus 37.2 per cent. of the total amount present.

BUILDING A GLASS-HOUSE WITHOUT PERMISSION OF TOWN AUTHORITIES.

A case of considerable interest to photographers was recently tried at Canterbury. We reproduce the details from a local paper with which we have been favoured. It seems that the Town Council entered proceedings against Mr. F. W. Nichols, a photographer, for having erected a new building, the external and side walls of which were not constructed of brick, stone, or other hard and incombustible substances, and without the permission of the Urban Sanitary Authority of the city, contrary to the bye-laws.

Mr. Flint, Town Clerk, in prosecuting, proceeded to say that the defendant was a photographer, who had recently taken up his residence in Canterbury, and had commenced the erection of a wooden building without the knowledge of the Sanitary Authority, and without sending plans to them. The Surveyor's attention had been called to the fact that the building was being constructed of combustible materials, and, therefore, in contravention of the bye-laws. Mr. Hall went up to the defendant's house, and told him that he had better not go on with the building. In answer to that Mr. Nichols sent in an application to the Surveyor, asking the General Purposes Committee to allow him to erect a temporary portable studio at the back of his premises, but the Committee decided that they could not sanction it. Immediately after that a letter was written from the Town Clerk's office, calling on the defendant not to proceed further with the building. There were two bye-laws, Mr. Flint said, which the defendant had broken—the first, that he had neglected to send in plans to the Surveyor, and in his letter he had called the defendant's attention to the fact that he had already rendered himself liable to be proceeded against, but that as he had erred in ignorance the Council had decided not to take proceedings upon that bye-law. At a later meeting the Council decided that the defendant must enter into an agreement to remove the building before Michaelmas, and under this understanding they agreed to stay proceedings, but expressly stating that the building was distinctly illegal. The agreement was prepared, and was read over to Mr. Nichols, who refused to sign it. That refusal was reported to the Council, and proceedings were ordered to be taken if the defendant did not remove the building, or undertake to remove it before October. The bye-law under which these proceedings were taken was bye-law 7, which enacted that the external and party walls of any building should not be constructed of combustible material, unless the Urban Sanitary Authority should otherwise allow, on the ground that they were not calculated to promote the spread of fire. The defendant had also contravened the 29th bye-law of the Sanitary Authority, by not sending in a notice a fortnight previous to the commencement of building, nor any plans of the proposed erection. It had been said—and he would anticipate the defence—that the building in question did not come within the meaning of the Act, because it did not belong and was not fixed in the freehold; and it was undoubtedly true that the building had been placed on wheels, but these wheels were of no use for moving the building, as it was surrounded by four walls, and could not be removed without breaking some of these down. The Magistrates ought rather to consider the intention which the defendant had in erecting it; for there was no doubt that in these days the largest buildings could be removed on wheels by mechanical contrivances. To put this more clearly before the Bench, Mr. Flint quoted the case heard in the Court of Common Pleas of *Stevens v. Gourley*. This was an action brought under the 12th section of the Metropolitan Building Act, which provided against the erection of combustible buildings similar to the one concerning which the present proceedings were brought. The house or shop which it was sought to remove was built entirely of wood, and rested on timber foundations laid upon the surface of the ground. In giving a judgment for the plaintiff, Chief Justice Erle, among other remarks, said:—"As to the argument that had been raised as to whether this was a 'building' within the meaning of the Act, the building was to be composed of wooden joists laid on the ground, with wood added until the shop was made. He was of opinion that a house con-

structed of wood, although it might not be resting on masonry let into the ground by way of a foundation, was, when he considered the combustible materials of which it was formed, within the mischief provided against by that Act. It had been argued," the Chief Justice continued, "that because that structure was moveable and capable of being moved in its entirety, it was, therefore, in the nature of a box or small article, and could not with any propriety of language be considered a house. But the answer to that was, that though, by the application of mechanical power, a large structure might be removed in its entirety, that did not prevent it from being a building under the Act." In this decision Judges Williams and Crowder concurred. Judge Byles also agreed, remarking that without attempting to define the word "building," "he thought it was usually understood to be some structure or erection of considerable size, intended to be permanent, or, at least, to last for some time, whether let into the ground or not." The building under consideration "was, in his opinion, clearly a building in the ordinary sense of the word. Then what was the object of that Act of Parliament? One of the objects was to prevent the erection of combustible structures, and therefore, looking at the ordinary meaning of the word and the object of the Act, there could not, he thought, be a doubt but that that was a building within the meaning of the Act." These opinions of the judges, Mr. Flint argued, went to show that the word "building" was intended to include structures that rested on the land, and was not confined to those whose foundations were built into the ground. Mr. Flint then put in a printed copy of the bye-laws, which were legalised by the Local Government Act.

The evidence of Mr. Hall, the City Surveyor, was then read. He said he had examined the building which was the subject of these proceedings; it was built entirely of wood. He considered it dangerous. It was standing when he last saw it, and he had received several complaints about it.

Examined by Mr. Flint.—The size of the yard was 30ft. 7in. by 13ft. 10in., and the size of the structure 19ft. 10in. by 9ft. 4in. The property was inclosed by walls, and there was no means of getting the building out of the premises, not even if the boundary walls of the premises were pulled down. The joists or sleepers on which it was built were laid flat upon the ground. When he first saw it, there were no wheels upon the building, but since then wheels had been attached. He considered they were of very little use indeed for the removal of the building, for it was made in two parts, and two wheels were on one part and two on the other. The wheels were 14 inches in diameter. They were new, but the body of the building was of old material.

Cross-examined by Mr. Minter, who defended.—The building had no connection with the walls of the premises on any side. He would undertake to say certainly that the building was not a carriage. It was built of weather boarding. He knew what weather boards were, and these were a sort of weather boarding. The building was fastened together by ordinary cast iron buttons, and in other parts by hinges. It could not be taken down, in his opinion, in an hour and a half. One of the moveable panels of the building was shown to the witness, and he said it was made of weather boarding.

Mr. Minter.—Do you mean to say, as architect of this city, you required plans to be sent in of such a structure as this?

Mr. Flint.—We must abide by the law.

In reply to Mr. Drury, Mr. Hall said the roof was partly of wood and partly of glass.

This was the case for the prosecution.

Mr. Minter, in reply, argued that this was not a building within the meaning of the Act of Parliament. He should have liked the Bench themselves to have gone and seen the structure in question, a course that would have been more satisfactory than to take the evidence of the Surveyor. The structure in question was merely one of the ordinary travelling photographic carriages which might be seen going about from place to place. If they were to begin by saying that it was a building within the meaning of the Act, they would then have to proceed against all the coach-builders of the city, and to require them to send in plans of every new carriage they built. It was perfectly true that the first time the Surveyor saw the structure it was not on wheels, but that was because the old ones were worn out, and the defendant had ordered a new under-carriage to be made. He called

Henry Solly, a coach-builder of Canterbury, who stated that he should consider the structure in question a carriage, and he could take it to pieces in an hour and a half.

This was the complete case, and the Magistrates immediately decided in favour of the defendant, the Chairman saying "they had given great consideration to the case, and from what appeared before them in evidence they were of opinion that the structure was not such a 'new building' as to come within the bye-laws of the Sanitary Authority."

Mr. Flint.—I shall then have to ask the Magistrates for a case on the point of law.

Mr. Aris, Chairman of the Bench.—It is a question of fact, and not of law.

Mr. Flint.—It is a broad question, and I shall advise the Council to appeal against the decision.

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THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE Forty-fifth Annual Meeting of the British Association was opened at Bristol on Wednesday, the twenty-fifth ultimo, Sir John Hawkshaw, C.E., presiding. In point of numbers the meeting must be regarded as a great success, the attendance of members and associates, as might have been expected, from the interest attaching to the noble city of Bristol, and its beautiful suburb, Clifton, exceeding by some hundreds that of several preceding years; whilst in interest, possibly, the meeting has fallen short. No "burning questions" have occupied the attention of the assembled savans. The sections have been pretty well occupied by a multiplicity of subjects; but no topic of all-absorbing interest—no great discovery—no pre-eminent "lion"—has given especial zest to the proceedings. The president did not leave the safe track of science—of things known or knowable—to wander in the trackless mazes of speculative philosophy, and throw down the gauntlet to theologians. Sir John Hawkshaw, in his inaugural address, as became one of the foremost engineers of our time, confined himself to the subject upon which he could convey definite information of value and interest, and, after glancing at the engineering achievements of past ages, especially interested his audience by dwelling upon the facts and possibilities of railway enterprise in the present day. The popular evening lectures, soirées, and—startling innovation—ball, were well attended and successful. Especially admirable in its illustrations was the lecture of Mr. Spottiswoode on the polarization of light, although it fell short, as such lectures generally do, in the attempt to combine scientific precision and detail with essentially popular exposition.

In matters of direct photographic interest the present meeting was probably more barren than any of those, gradually decreasing in such interest, held for years. The progress of photography of late years has consisted more essentially in modification, improvement, and development of known methods, and in extended application, than in specific new discovery, and the subjects connected with photography suitable for the consideration of any of the sections of the Association, as well as the especial scientific experiments, seem to grow fewer and fewer. During the lifetime of the late M. Claudet, scarcely a meeting of the Association passed without one or more papers from him relating to some scientific phase or outcome of the art. At the present meeting there were several papers which will interest photographers, without being directly photographic. Captain Abney's interesting paper on the varying relation between the illuminating actinic values of the electric light, depending upon the mechanical force producing it, will interest many; as will also Mr. Gatehouse's paper on nitrite of silver. These articles will be found on another page. The report of a committee appointed at Bradford in 1873, on the physiological action of light, read by Dr. J. G. McKendrick, possesses incidental interest for all who study the science of light.

The results arrived at by the committee are as follows:—1. The impact of light on the eyes of mammalia, birds, reptiles, amphibians, fishes, and crustaceans, produces a variation amounting to from 3 to 10 per cent. of the normal electro-motive force existing between the surface of the cornea and the transverse section of the optic nerve. (2) This electrical variation may be traced into the brain. (3) Those rays that are regarded as most luminous produce the largest variation. (4) The electrical alteration is due to the action of light on the retinal structure itself, as it is independent of the anterior portion, eliminating therefore the natural supposition that the contraction of the iris might produce a similar result. It is possible by experiment to discover the physical expression of what is called in physiological language "fatigue." (5) The method employed in this research may be applied to the investigation of the special organs of the other senses. One of the principal difficulties in arriving at the exact relation between the electrical variation and lights of different luminous and colour intensity was the continually diminishing sensibility of the retina to the stimulus, owing to the abnormal condition of the eye when separated from the body and deprived of blood. This difficulty was overcome by placing the animal under the influence of woorara or hydrochlorate of chinoline, both of which substances deprived the animal of sensation and motion; thus experiments can be made upon the living eye without removing it from the body or in any way injuring the animal. It was found that on applying the electrodes of the galvanometer to the cornea and to the surface of the skin large deflections were obtained, sensitive to light, and showing a remarkably constant alteration. In the early part of the investigation it was found that sometimes the initial effect of light was to produce an increase, and at other times a diminution, of the natural current circulating through the optical apparatus; but no explanation was then offered as to the cause of this apparent anomaly. It has now, however, been demonstrated by a large number of experiments that the variation is related to the primary direction of the current. If, for instance, the cornea be positive to the surface of the brain the initial effect of light is an increase; if, on the other hand, some portion of the brain be positive to the cornea the initial action is a diminution of the natural current, thus showing that the current superadded or induced by the action of light is always in the same direction, only in one case it is added to, and in the other subtracted from, the natural current. The committee have also examined the action of polarized light and of the various coloured rays of the spectrum, with the result of showing that in all cases the yellow rays produce the greatest effect. They have also found that the extreme violet rays and the low red rays produce no alteration. The committee then attempted to measure accurately the electro-motive force of the living eye. This they did by means of Mr. Latimer Clarke's method of the comparison of electro-motive forces. From a large number of observations it has been found that the electro-motive force of the nerve currents dealt with in these experiments on the eye of the frog amounts to about 1-350th part of a Daniel's cell. This was compared with the electro-motive force of the muscle and nerve of the frog: the muscle gave about 1-35th, while the nerve gave 1-480th part of a Daniel's cell. Lastly, the committee have recently made a series of elaborate experiments, by means of an instrument called a chronograph, devised by Reignault, as to the time required for the action of light upon the eye of the frog. It has been found to occupy about 1-10th of a second, thus remarkably agreeing with the conclusions arrived at by various Continental physiologists as to the time occupied by the action of light on the human eye. The result of this investigation shows that the electrical variation observed in the action of light is what occurs in the eyes of all members of the animal kingdom.

In the section devoted to physiology, Mr. H. B. Brady exhibited a series of micro-photographs, chiefly from physiological and pathological preparations, produced by a method devised by Mr. Bowman, of Newcastle-on-Tyne. The apparatus was also shown, and described to consist of a simple mirror of spectrum metal placed at an angle of forty-five degrees in place of the eye-piece of the microscope, and directed downwards. The image was received upon a collodion plate set in the frame of a common photographic camera, and photographs taken in the usual way. About eleven seconds was stated to be sufficient exposure for the purpose. Professor McKendrick suggested that these photographs might be made on transparent screens, which would afford a beautiful way of illustrating certain objects. Mr. Brady said it would be just as easy to produce them on screens as on paper. A photograph, he was aware, could never replace a drawing, but it answered its purpose, and was by degrees being perfected. In answer to questions asked, he added, that though the apparatus used was not now to be obtained of any optician, it had been shown to a well-known optician, who would probably make a camera of this sort. He repeated that he had not brought these as perfect speci-

the arrangement or disposition of the panes is limited to a photographic studio, and in placing each pane of glass that the light rays through it to the point occupied by the object photographed shall traverse the glass at right angles to the plane thereof. And my invention comprising the panes in two sets facing each other, every alternate pane, for instance, faced by the sitter, at one end of the studio, of light in passing to the said point of focus, as possible at right angles thereto, and the intermediate panes to face in like manner at the other end of the studio, and the object to be photographed may be placed at the other end of the studio according to the most

room. This display of pictures is very attractive, and comprehends, besides every style and size of portraiture, a fine collection of landscapes and of the combination pictures which have been amongst the chief ornaments of the photographic exhibitions held for many years past. Some of these have been converted into paintings, and pleasantly vary the display of effective coloured work to which one side of the room is devoted.

We now pass into the studio, which is on the same floor, and so arranged that an invalid's chair may easily be wheeled into it. It is a spacious room, thirty-six feet long by fourteen feet wide, the eaves are low and the ridge high, the former being five feet six inches and the latter fourteen feet from the ground. There is glass at one side only, which faces north; the side-lights, which are continued to within two feet of the ground, are obscured, the principal light being obtained from the large steep north skylight, which is made longer by the ridge being out of the middle, so that the glass extends over considerably more than half the room. The south side, and the south roof, which is flat, are opaque. Each end is of course opaque, as is also a space at each end of side and top-light. A very complete system of blinds govern the light, which, however, rarely requires re-arranging. They are divided into sets, each overlapping its fellow at the edges; in the centre are two black blinds, and at each side of these two white blinds. They are attached to rollers placed at the ridge, and are worked by cords passing over a pulley, and held in position by sash weights. Each pane of glass is two feet wide, so that as little obstruction as possible is offered to light by sash-bars.

The walls of the studio are of green-grey with a small diaper pattern. The floor is covered with linoleum with a maltese cross pattern. Hot water pipes maintain the whole establishment at a comfortable temperature. At each end of the room is a series of backgrounds with canopy over head, and a stand formed of the base of a head-rest, with cross-piece at the top, to which is attached a curtain for ready use in any position, either to secure shadow, or enter into the picture. A large collection of chairs of varied design and great comfort, cabinets, tables, footstools, sofa, &c., give an air of elegance and comfort, and afford as well great variety of effect in the pictures. In the studio and in the dressing-room we find an interesting and curious collection of children's toys of all kinds likely to arrest and retain attention, and here we find one of the elements, at least, of the number of unusually successful and charming portraits of children which has attracted our attention in the reception room.

Still on the ground floor, we come to various other rooms. We need not dwell upon the dark room, beyond remarking that it is not dark, but well illuminated with yellow light; nor upon the printing rooms, beyond adding that they are admirably arranged. After leaving these we come to an open air studio, in which we find banks covered with growing wild flowers, and natural rustic accessories in profusion. Here are taken instantaneous groups, portraits of animals, and figures requiring open air lighting for introducing into landscapes, or for other pictorial purposes. On the next floor are rooms devoted to enamelling, mounting, finishing, &c., the large room over the flat portion of the studio being used as a painting room; in which we find at the present moment a variety of large canvasses with landscapes and figure subjects in various stages which Mr. Robinson is engaged in painting in the moments he can snatch from the glass room.

A glance at a noteworthy studio would be obviously incomplete without some brief reference to the artists. There is always a natural curiosity in a community in regard to the history and personnel of one who has attained especial position and rank in its midst. It is a difficult and a delicate task to enter into such details in relation to living characters, and we shrink from it as having something of the character of vivisection. The influence of Mr. Robinson on photography has, however, been so

specially marked, that a few personal details seem desirable. Photography, as it was natural such a new power should, has developed latent artistic talent in many, whilst it has allured some from other artistic paths in which they had already commenced a career. Mr. Robinson belongs to the latter class. Born with an artistic temperament, he early commenced its culture, and at the early age of thirteen years we find him contributing articles and illustrations to the "Journal of the Archaeological Society," the "Illustrated London News," and other journals. Etching, sculpture, painting, and literature, nearly equally divided his attention as a youth; painting, however, gained the day, and at twenty-one we find him an exhibitor at the Royal Academy. Shortly after this the comparatively new art of photography cast its glamour over him, he became an ardent devotee at the new shrine, and, encouraged by Dr. Diamond, who saw some of his work, nearly twenty years ago he commenced the career of a professional photographer in Leamington. From the outset of this career he began to exercise a powerful influence on photography as an art, an influence he has most steadily maintained. In the early days of photography a few able amateurs produced fine pictorial studies, but none of them maintained a steady interest in this class of work, and their names are scarcely known by the present generation of photographers. Rejlander and Robinson alone had a steady faith in the pictorial capacity of photography, and proved their faith by their works. The first picture Mr. Robinson sent to a photographic exhibition created an extraordinary interest, and much discussion in the outside press, as well as in the photographic journals. This was entitled, "Fading Away." The discussion waxed hot as to the mode in which such an effect was produced; as to the legitimacy of treating such a subject by photography; as to whether the principal model was really a dying girl; as to the propriety of using such a model if she were so, and if she were not so, as to the possibility of truth in the picture. We do not intend to renew the discussion now, we simply refer to the matter as illustrating the deep power and pathos of the picture. Since that time (1858) scarcely an exhibition has passed to which Mr. Robinson has not contributed at least one large pictorial composition, and frequently several. We have mentioned on a former occasion that Mr. Robinson commenced his professional career with the resolve to produce each year at least one picture, to show the pictorial capacity of the art, quite apart from "pot-boiling." This, and more than this, he has done. Probably the earliest pictorial composition produced from many negatives was Rejlander's "Two Ways of Life," a marvellous work, both in conception and execution; the most perfect picture produced by a similar method to our personal taste is Robinson's "Bringing Home the May." We do not intend either to enumerate or criticise the extended series of similar pictures he has produced; but we must mention one especial characteristic of the bulk of Mr. Robinson's pictorial work, a characteristic which is in our estimation exceedingly wholesome. With the exception of a few of his earlier works, all his pictures have represented scenes and subjects possible to photography, rendering the poetry and beauty of actual nature. The artist who attempts to render historic personages or creations of a poet by photographs of living models, risks, and often incurs, ignominious failure; he who attempts to represent spiritual beings by photographs of corporeal models cannot escape failure. Scenes, incidents, and persons in actual nature, objects and subjects which may be placed before a camera, may be used legitimately for pictorial photographic purposes; and it is by rendering the poetry and beauty of scenes in English every-day life, in which Mr. Robinson has so eminently succeeded.

The pictorial work to which we have been referring, although pursued ardently, has never superseded the legitimate work of professional life. Mr. Robinson has been as skilful and successful in every branch of por-

traiture and in landscape as in purely pictorial work. Ten years ago the over-exercise of this unceasing energy produced a degree of debility which rendered rest imperative, and having acquired a competency, Mr Robinson retired from business for a time, and, after a rest of two or three years, recommenced professional life in Tunbridge Wells.

A life like that which we have briefly indicated cannot fail to have an important influence on the young art to which it is devoted. The example both of the works and the man are stimulating, and we cannot but regard it as fortunate that photography rather than any of the branches of art to which his proclivities leaned, secured the young artist. Some of the early loves still occasionally make good their claim. Our readers are very familiar with his facile and vigorous pen in our pages; the readers of his lessons in "Pictorial Effects in Photography" have seen his effective etchings; and very many of those photographers who have visited his home at Tunbridge Wells have seen examples of his sculpture and painting. Fortunately for photography, a habit of unwavering decision has kept him true to the art with which he cast in his professional lot, and this has secured for him the success which ever attends well directed energy and ability.

In recommending business at Tunbridge Wells it was Mr. Robinson's good fortune to become associated with a gentleman who, having just completed his articles as a civil engineer, had resolved to commence professional life as a photographer. Mr. Nelson K. Cherrill had rendered his name familiar to our readers by able contributions to the PHOTOGRAPHIC NEWS, and also by contributions of some fine landscapes admirably printed in carbon to one of the exhibitions, before he became associated with Mr. Robinson; and his personal work has secured medals at various exhibitions since. His career is, however, still before him, and photographers will yet hear more of him.

Correspondence.

PHOTOMETRY.

DEAR SIR,—I should be glad to hear more of Captain Abney's method of preparing graduated strips, and also of his means of reading off. The information would, I have no doubt, be both of interest and use to other readers besides myself. Photometry is a difficult subject, and at present is in a very unsatisfactory state. "Many miles from many minds" will be needed to make it what it ought to be.—Yours truly,

D. WINSTANLEY.

The Doctor's Cottage, Blackpool, August, 18th.

FASHIONS AND PHOTOGRAPHY.

DEAR SIR,—In your issue of the 6th of August, under the head of "Photography and Stage Management," you made some excellent remarks on an article which had recently appeared in the *Globe* in reference to "Stage Costume." Will you kindly allow me to make a suggestion, through the medium of your valuable journal, in respect to costume and photography? What I would venture to propose is this, that some London enterprising publishing firm should issue a monthly publication containing the usual letterpress relating to the fashions of the times; but that, instead of the old style of coloured engravings and wood-cuts, to replace them with photographs from the life. If any one will take the trouble to look at any ordinary coloured fashion plate he will see that the figures are nearly always out of all proportion, whereas a photo print from life would not only be a figure in proportion, but also an exact representation of the costume. Besides the larger coloured picture, containing in turn different styles of dress, there could be smaller ones uncoloured, devoted to such articles of dress as follows: viz, hats, bonnets, boots, shoes, gloves, &c. I would advise the firm that undertakes the publication of such a work on the fashions to enter into communication with M. Worth, of Paris, and the other leading modistes of London, Berlin,

Vienna, New York, &c., and arrange for the obtaining of negatives, photographed from life, of young ladies wearing the latest fashions of dress that have been invented, together with other negatives of all such articles pertaining to dress and fashion that would be considered advisable for publishing. These negatives from abroad could be reproduced by any photo-mechanical printing company, and such prints as were required could be coloured in either oil (if large) or water colour.

I have but little doubt that if the book is well appointed in the matter of paper, good type, with a neat and attractive outside cover, it would meet with a good demand; and it would possibly take the lead among the periodicals devoted to the fashions of female dress, from the very fact that its plates were true to nature and art; and it would be the means of giving employment, as well as remuneration, to a great number of persons connected with photographic art; and it would also enable the fair sex to judge of the exact appearance of a certain style of costume with the greatest facility and ease. Having had some professional experience in the designing and colouring of fancy costume, I should be very pleased to render any assistance that I could to any one publishing such a "book of fashions" as I have named.—I am yours faithfully,

GEORGE CROIL HANON.

METHYLAL IN DEVELOPER.

DEAR SIR,—Much engaged by the interesting details in your columns furnished by Mr. Warnerke, I hastened to make myself *au fait* with the effects of this new accelerator, and having distilled enough methylal to furnish a few ounces of developer, I eagerly set to work.

The results were disappointing; although, with wonderfully short exposures, the image flashed out instantly the developer was applied, it remained after intensifying very thin and weak. The distillation was carefully carried out, 30 minims of methylal to 100 grammes of iron sulphate employed, and Rouch's collodion used. The developer after three weeks' keeping has scarcely, if at all, coloured by formation of sesquioxide salt, and it flows easily without addition of alcohol. Thus all conditions except one—and that, unfortunately, the chief—are fulfilled.

I do not for a moment doubt ultimate success after such testimony as that of Mr. Warnerke; there must be some condition inadvertently unfulfilled on my part; and I hope that for our general benefit Mr. Warnerke, guided by his experience in the field of research he has trodden, will be so good as to point out where in this process error is most likely to happen.—Yours sincerely,

E. T. ROLLS.

Exeter, August 31st.

MR. VANDERWEYDE'S NEW STUDIO WINDOW.

SIR,—As in your absence from town, I am deprived at this moment of your presence and report as Editor, may I ask the insertion of the following details in your correspondence column, which may serve to give your readers some idea of my new mode of lighting, upon which you will doubtless ultimately report. As all improvements tending to produce better modelling and shorter exposure in portrait negatives are welcome to the photographic world, I submit the accompanying diagrams, illustrations, and explanations of my recently invented and patented improvement in the construction of photographic studio windows.

My invention relates to the arrangement or disposition of the glass through which light is admitted to a photographic studio, and the invention consists in so placing each pane of glass that the direct rays of light passing through it to the point occupied by the sitter or object to be photographed shall traverse the glass as nearly as possible at right angles to the plane thereof. And my invention further consists in disposing the panes in two sets facing opposite positions, making every alternate pane, for instance, face towards the point to be occupied by the sitter, at one end of the studio (so that the direct rays of light in passing to the said point shall traverse the glass as nearly as possible at right angles thereto as above mentioned), and the intermediate panes to face in like manner towards a similar point at the other end of the studio, so that the sitter or object to be photographed may be placed at the one or the other end of the studio according to the most

favourable direction of the light. Each set may be provided with blinds or shutters to exclude the light from that end of the studio at which the camera is placed for the time being, and where it is not required.

In arranging the glass as last described I have regard not only to so dispose it that the rays of light passing to the point to be illuminated shall traverse the glass as nearly as may be at right angles as above mentioned, but, which is of greater importance, if the operator is to work from either end of the studio, I take care that those panes of glass through which the light is not admitted for the time being shall be edgewise towards the point occupied by the sitter; that is to say, shall be in planes converging towards the said point, so that the said panes and the sashes, and the blinds or shades in which they are fixed, shall obstruct the least possible amount of light.

In photographic studios as at present constructed the greater part of the light passing in the direction of the sitter traverses the

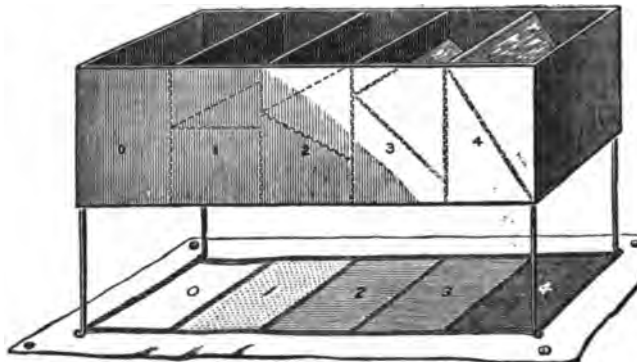
glass more or less obliquely, the angle varying with the distance of the glass from the sitter. It is thus obvious that the light must traverse more than the actual thickness of the glass, and must, therefore, be obstructed by absorption and by reflection to a greater extent than if it passed through the glass at a right angle. The light is further obstructed owing to the depth and position of the ordinary sashes and frames in which the glass is fixed, whereas according to my invention the glass is placed in the most favourable position for the passage of the light, which is but slightly obstructed by the sashes and frames, as I am enabled to combine greater lightness of construction with the necessary strength.

The advantage of my invention is to reduce the time necessary for exposure, and to give to the image obtained greater roundness, vigour, delicacy of modelling, and point.

Description of Drawings.

The object of fig. 1 is to prove that light passing through glass

FIG 1



is more or less obstructed in proportion to the angle which the glass bears in relation to the point to be illuminated. This drawing represents a metal box containing four partitions, and painted black inside. It has no top or bottom. No. 1 represents a piece of glass placed inside at right angles; 2, 3, and 4 are other

glass placed at different angles; and the shadow cast underneath the box shows the amount of obstruction caused by the increasing angles of the glass.

Figure 2 is a horizontal section of a photographic studio.

AA is the side wall of the studio, and BC are two

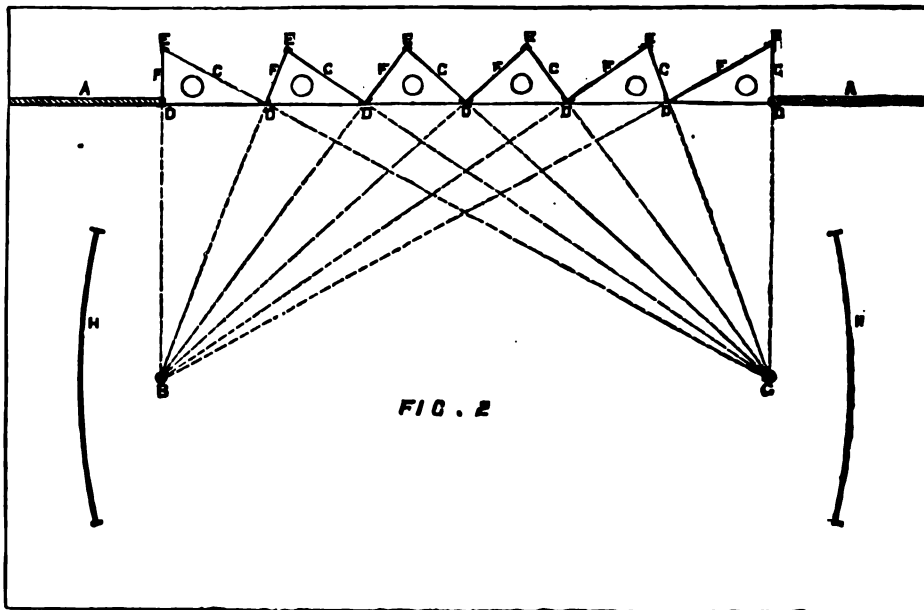


FIG. 2

points near each end of the studio at any convenient point in its width, at either of which the sitter may be placed. In constructing the window, I place at equal distances apart a number of vertical sashes, D. The distance between these sashes will depend upon the width of the panes of glass to be used. I find it convenient to place them about two feet apart. The glass is fixed between the inner row of sash-bars D, and an outer row of bars E, the position of the glass being shown by the lines EG. A convenient way of finding the position for the outer row of sash-

bars E is by drawing radial lines from the points B C respectively through and beyond the points occupied by the sash-bars D, and at the points E, where the lines first intersect each other beyond the row of sashes (D), I place the outer row of sash-bars, E.

The panes of glass are thus divided into two sets facing in opposite directions, all the panes of the one set (F) facing as nearly as possible the point B, at the same time that they are edgewise or radial to the point C; while, on the other hand, all the panes of the other set (G) face as nearly as possible to the point C, and

are edgewise or radial to the point B. Thus arranged, the double row of sash-bars does not obscure any more light than a single row, and it will be seen that if the sitter be placed at B the glass G can be darkened by blinds or shutters, the light only being admitted through glass F, so that without obscuring any of the light passing in the direction of the sitter the light is cut off from the remainder of the studio, which is not required to be illuminated.

Similarly, if the sitter be placed at C, the glass F may be darkened, and light only admitted through G. As before stated, with this arrangement the light which illuminates the sitter traverses the glass as nearly as possible at right angles thereto, which is the most favourable direction, as the light is less obstructed by reflection and absorption than when it passes through the glass obliquely. Each series, F and G, are provided with independent roller blinds or sliding shutters to regulate the admission of light as required. The window in the roof is constructed on precisely the same principle as that above described. Owing to the greater stiffness of the window-frame obtained by the double row of vertical sash-bars, I am enabled to dispense with the heavy horizontal beam at the eaves of the roof which forms part of the framework in the ordinary construction of photographic glass houses, and which divides the light into a top light and side light, thereby producing two distinct high lights in the subject photographed. This defect is avoided by my invention.

In lighting a head we should aim at quality and direction, and not mere quantity, of light. My design secures this in the highest degree, and also admits of the most novel and perfect ventilation; the light can be made to assume almost any shape; there is no obstruction; and the beauty of the design renders this glass house the most attractive and interesting part of a photographer's establishment.—Yours truly,

August 19th.

H. VANDER WEYDE.

Proceedings of Societies.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of the above Society was held on Monday, the 2nd instant, at the Victoria Hotel, Bradford, the President, Mr. J. W. GOUVER, occupying the chair.

The minutes of the last meeting having been read and confirmed, Mr. BERRY, of Gomersal, was elected a member.

THE SECRETARY laid on the table five numbers of the *Journal de Photographie* which had been forwarded for the Society's use. He was instructed to post in return the *British Journal of Photography* monthly in acknowledgment of the compliment.

The conversation then turned on the discussion of the validity of the Lambertype patent which was being carried on through the medium of the journals.

MR. W. E. BATHO, in alluding to M. Lambert's reply to his paper read at the last meeting of the Society, read the following quotations from the law regarding patents:—"Occasionally a patent is taken out jointly in the names of two or more persons; but if it be found that one or more of such persons had no part in the discovery, the patent is void." "The invention must be new—not previously used by the inventor or others." "The specification is null if any part claimed be not original."

After several remarks by Messrs. MORI, WORMALD, and others, the subject was dropped.

MR. WORMALD inquired if any member could tell him the best method of mounting autotype prints. He had had a large number to mount, and had met with much difficulty in inducing them to lie flat.

MR. BATHO remarked that, when wetted, the two films of gelatine and paper would curl, and then begin to curl the opposite way. The time to mount them was when both films were equally expanded.

MR. WORMALD said the manner in which he had overcome the difficulty was by placing both print and mounting-boards between folds of wet blotting-paper.

MR. SACHS inquired if any one had noticed any symptoms of fading in autotype prints. He had had a large autotype on drawing-paper for about six months, part of which time it had been exposed in his window, and it displayed unmistakable signs of deterioration.

MR. CROSTWHAITE remarked that the deterioration in colour of drawing-paper was a well-known and acknowledged fact. He himself, only a short time before, had occasion to remove a water-colour drawing from a frame where it had hung for some months, and found that where it had been exposed to light it had turn

to a yellow tint, but under the mount it retained its original whiteness. He thought it possible that the paper on which Mr. Sachs' picture was transferred had turned slightly yellow, and thus reduced the apparent brilliancy of the picture, though there might be no real deterioration in the blacks of the picture.

MR. SACHS was of opinion that the blacks were decidedly reduced, and some of the half-tones gone.

MR. BATHO said permanency was entirely a relative term; nothing was really permanent. He was of opinion that an autotype picture was as permanent as an engraving, and most certainly much more so than a silver print. The paper, it was certain, would not keep permanently white; but, seeing that the picture consisted of a permanent pigment, bound up in insoluble gelatine, he thought the process was really as good as anything they could expect.

MR. SACHS said he had in his possession a silver print some fifteen years old which was now as good in colour as when it was printed; and he thought that, with proper treatment, a silver print might be made as permanent as a carbon picture.

MR. GRAVES said it was probable that one of the causes of the present fading of prints was to be found in the inferior quality of the albumenized paper now in use. It was nothing like the paper in the market some ten years ago. There seemed to be a general falling-off in quality.

MR. BATHO remarked it was often said that paper prepared with blood albumen was much more liable to fade than when prepared with egg albumen.

MR. CLARK kindly volunteered to exhibit and explain the difference in the constitution and qualities of the two albumens at the next meeting.

After some further conversation, the Secretaries were instructed to obtain a portfolio for contributions for the members' use, and an album to which all the members might contribute their portraits.

The meeting was then adjourned.

To Correspondents.

PROTRACTED CONTROVERSY.—We feel it an imperative duty to our readers generally to close controversies when they are protracted beyond the bounds of public interest, and when they degenerate, as they so frequently do, into purely personal disputes. We have received this week letters on controversial questions which would fill nearly half of the present number; whilst we have received, on the other hand, several protests from readers who are anxious to find matter of practical scientific interest in our pages, instead of discussions between individuals on subjects of comparatively little interest to the photographic community generally. Whilst we are anxious to oblige all our correspondents, each of whom feels doubtless the urgency of his personal claim to publication, we are compelled to condense or suppress the controversial letters we have received, that they may not entirely take the place of the matter to which our pages are legitimately devoted.

THE LAMBERTYPE.—As we intimated in our last, the controversy on this subject was then closed. If we re-opened it to one or two writers, we must do the same for rejoinders to these, and so on *ad nauseam*. To avoid risk of unfairness or discourtesy, we briefly condense the communications of one or two correspondents in this column. First of all, we have a temperate letter from Mr. Batho, who expresses regret if any of the language in his former communications has been more forcible than journalistic practice and courtesy would warrant. Referring to M. Lambert's disavowal of a claim to the use of paper on both sides of the negative, he thinks that the specification makes such a claim in mentioning the method, and not disavowing a claim therein; and proceeds to quote, in confirmation of his view, the words of Lord Chief Justice Jervis, *re Talbot v. Larocche*:—"Where Mr. Talbot did not claim the whole of the invention he ought to have said so, as he had said with reference to other things in his specification that were well known, for a man might state what was new and what was old, with these exceptions: that when he patented a combination of old things, and you could so understand that by the specification, it was sufficient to define it. If he said he had got a new system, and in the middle of it he took in an old system without saying that that part was old, the specification would be bad; for it must be stated distinctly what was old and what was new." Mr. Batho then refers to the letter of "A Licemee," and remarks, "It would be well to see if the specification *claims* the points of difference named therein; if it does not, such letter has no bearing on the real question, Is the patent valid?" He concludes by remarking that as Mr. Croughton in our last says that he is using the method at the present time, it only remains for M. Lambert to "cry havoc, and let slip the dogs of war." We may observe on this point that as M. Lambert affirms that the

process Mr. Croughton is using is not the patent process, it is hard to see why they should quarrel. We have next a letter from Mr. Croughton, replying to some of the statements in M. Lambert's advertisement. It would be obviously unfair to admit into our literary columns comments upon the announcements in our advertising pages, which constitute a distinct department of the journal, not under Editorial supervision. Mr. Croughton denies that he was taught the application of paper to the negative by Messrs. Southwell Bros., and enters into details of his engagement with that firm for which we have not space. He also requests our readers to compare the opinion of Mr. Maddison with that of the Editor of the News, published at the time. "M. C." comes in as a new combatant, and, as such, cannot urge a legitimate claim to speak after the controversy is closed. The chief aim of his letter is to ask, if M. Lambert has not introduced a new process as his opponents affirm, how it is that the results he has produced possess such novel excellence. Our correspondent says:—"The Lambert results at least seem to be new; they created a sensation in France last year; you, sir, were evidently surprised and delighted with them when you saw them in Paris; they are praised with one consent now by all who see them. How is it, if Mr. Croughton introduced the process years ago, that his results did not create a similar *furore*? How is it that the work of others who say they have used M. Lambert's process for years has never created a sensation? None of these gentlemen will be willing to say, I presume, that they knew the method, but had not the skill to work it efficiently." Our correspondent's letter is a long one, but he must be content with the space we give to this extract. Finally, we have a letter from M. Lambert, signed in full, "Claude Leon Lambert," because M. Lambert understands that his former letters, dictated by himself to an interpreter, have been said not to have been written by him. M. Lambert thinks, with some justice, that, as the assailed person, he has a claim to a final reply. We must ask him, as the controversy is closed, to rest satisfied with the publication of a resume of his letter. After a few more words on Mr. Croughton's claims, M. Lambert expresses his contentment with the conclusion of our article which appeared in the News of November 1874. Referring to Mr. Batho's admission that the use of two old materials for a new combination is a fit subject for a good patent, and quoting Mr. Batho's reference to Mr. Crane's patent, "The use of the hot blast was not original, nor yet the anthracite coal; the originality consisted in a combination of the two," he adds:—"So it is with my patent: the use of the two papers on a negative is not original, nor yet, perhaps, the retouching on both sides of a negative; the originality consists in the combination of the two. Crane's claim was the use of anthracite coal and the hot blast for smelting purposes, whilst I claim the use of paper on each side of a negative and the retouching on these two surfaces for photographic purposes." He also refers Mr. Batho to line 27, first column, page 345, of this year's News, for the description of the method of applying the two semi-transparent papers to a negative, and the mode of making the paper used. Referring to Mr. Werge's communication, M. Lambert says that he can have no objection to photographers using other processes to obtain similar results, and recommends the ground glass varnish, which is really the best second thing; and he gives the following as the formula:—"Either one pint, gum mastic one-third of an ounce, gum sandarac two-thirds, and benzole eight ounces. Referring to the special formulas and instructions given to licensees, M. Lambert denies that any need existed for inserting these in his specification, as they arise out of, without being part of, his patent. "I am not legally bound," he says, "to give to non-licensees, or describe in my specification, my private formulas, often improved according to climate, &c., for the obtention of the relieve-chromic transparency and weak grey negative best suited to be treated by my patented method. I had also the right, and I have used it, to make contracts with manufacturers of patented materials, without which some of my processes cannot be used, binding them to deliver certain special materials to none but my licensees. I have also the right to forbid the sale of my patent chromotype self-registering process to non-licensees." Referring to prosecution of infringers, he says that "it is legally impossible in this country to bring an action against a man because he threatens to infringe a patent; but as soon as Mr. Croughton or friends succeed in making a print possessing the essential characteristics of the Lambertype print I will then have an investigation as to whether my patent is infringed or not." Referring to Mr. Fry, M. Lambert says it is not true that Mr. Colton is in his (M. Lambert's) employ, and that Mr. Colton's letter referring to Mr. Fry's negatives had no reference to the time when he was in Mr. Fry's employment. "Here are," he says, "the very words of Mr. Colton's letter:—'As to Mr. S. Fry's claim to have used this process since 1873, let me say that not long since I had an opportunity of seeing his negatives; not one was worked up by the method he says they were.'" M. Lambert denies Mr. Fry's statement that at Mr. Jabez Hughes' suggestion he was to invite him to Greenwich, and asks, "Why should I invite him in preference to any other photographer, his opinion, in any case as it stood recorded page 599 of the News of 1874, approving of the Lambertype process as described in

the News, being satisfactory?" In justice to Mr. Fry, M. Lambert adds:—"I must say that I have just received a letter from him telling me that he knows my processes will be of great benefit, &c., and assuring me of his wish of my succeeding in my enterprise, and of his sincere friendship." After an analysis of the motives of his opponents, into which we do not think it necessary to enter, M. Lambert concludes by thanking those who have aided him in securing fair play, which is all he desires. "I am quite honoured to see that notwithstanding all this petty trade jealousy, nothing has been said against the advantages of my processes, and not a single claim I make in their favour has been refuted. I think 'A Licensee's' letter in last week's issue, endorsed by you, sufficiently proves the novelty of my process and the validity of my patent." In future, all discussion on the subject must be conducted in our advertisement pages.

Mr. A. BROTHERS writes in relation to his controversy with Mr. Winstanley on the sale of secret processes, or rather in relation to Mr. Winstanley's statement referred to in our last, to the effect that Mr. Brothers had sold him a secret process. Mr. Brothers states that having reason to believe afterwards that the process was not secret, he authorized Mr. Winstanley to deduct the amount from an account due from him to Mr. Brothers, and this he considers equal to the sale not having been effected. Most readers will say, "scarcely equivalent." However, he adds that the facts had escaped his recollection when he wrote that he had "never sold" a process. The matter is unimportant, and we have not space for its further discussion.

Mr. J. R. JOHNSON writes a long letter in reply to Dr. Van Monckhoven. He points out that if his first letter was forcibly expressed, it was because he felt strongly indignant that Dr. Van Monckhoven, knowing that he had a suit pending in France, should take that occasion to publish a pamphlet in which the sole novelty was an attempt, unfairly and untruthfully, to underrate the worth and originality of his patented discoveries, such a work being, as he conceives, intended for quotation in court as the opinion of a disinterested witness. Mr. Johnson enters into some detail in support of the conviction he held, which would occupy more space than we can afford; and concludes by accepting Dr. Van Monckhoven's correction as to his means and the reception of his pamphlet at the French Photographic Society, but enclosing us his authority for each statement. In regard to the points in dispute in Mr. Johnson's claims, as the subject possesses some historic value, we shall devote a few words to the subject next week.

WANT TO KNOW.—The proximate cause of the spots of mildew is damp; but it is probable that if a carbolic acid or salicylic acid were added to the mounting paste, the tendency to mildew would be checked.

A. W. G.—We have not space to repeat formula and full details of the mode of preparing durable sensitive paper in this column; but our correspondent will find full information in each of our YEAR-BOOKS for the last three or four years.

A NUT.—We have seen bad cases of opaque spots and streaks, but none so bad as this. It might possibly be the result of turbid particles in the collodion, but it is scarcely likely. It is more probable that the streaks arise from floating particles of contamination in the shape of scum on the surface of the bath. Is the india-rubber top of vulcanized india-rubber?

PILGRIM IN THE EAST.—It is a misfortune that you have not the back numbers of the News, as you will see that it is impossible to reprint extended articles for the benefit of a single reader, however much pleasure we should take personally in doing so. The article in question, instead of giving a formula, expressly condemns the plan of adopting standard formulae, and points out the importance of first understanding principles, and then applying them as modified circumstances may demand. A freshly made iron developer and a freshly made pyro developer were mixed in such proportions as were required, and used as soon as mixed; they will not keep ready mixed. In some cases they may be kept ready mixed if nitric or citric acid be added also; but this reduces the energy of the developer. As a rule, pyro for development is abandoned, but it is still used by many for intensifying. If pyro be used for developing, a neutral bath is desirable with iron development and bromo-iodized collodion. The bath may be made freely acid with nitric acid without appreciable loss of sensitiveness, but a neutral bath may be used. In this case a ripe coloured collodion is desirable. We have not tried the plan you refer to as recommended in the YEAR-BOOK, but see no reason to doubt its perfect excellence.

SOUTH DEVON.—To use aurine collodion for a dark room window take plates of glass the size of the panes in the window, coat these, and, when dry, place them in contact with the panes, collodion side inward, and fasten with a few brads.

J. BRAIR, JUN.—Thanks for letter and enclosure, which we shall hold for an opportunity of trying.

E. SIMMONDS.—If you attend Stationers' Hall yourself the cost of registration will be one shilling, and one penny the cost of a form on which to make the entry properly.

G. B.—Write to the Secretary at 174, Fleet Street.

Several Correspondents in our next.

The Photographic News, September 10, 1875.**PHOTOGRAPHY IN AND OUT OF THE STUDIO.****PHOTOGRAPHY AND THE ARCTIC EXPEDITION—UNMOUNTED PHOTOGRAPHS IN COMMERCE—A PHOTOGRAPH FROM THE QUEEN—A NEW PUBLICATION—SWISS LANDSCAPE PHOTOGRAPHERS.**

Photography and the Arctic Expedition.—It is gratifying to learn that the Arctic Expedition, which has been sent out at so much expense to the country, is thoroughly provided with scientific apparatus of all kinds, and officers well fitted to use them. As we already stated at the time of the outfit being prepared, some attention was given to photographic matters, and the aid and advice both of Captain Abney, R.E., the Instructor of Photography at Chatham, and of Mr. Baden Pritchard, who has charge of the War Department Photographic Establishment, were sought and obtained. Materials for practising both the dry and wet process have been taken out in the *Alert* and *Discovery*, as also by Captain Allan Young, who has started on an independent expedition to the Arctic regions. On the *Alert*, the photographic duties are entrusted to Mr. White and Mr. Mitchell, and, as we have been informed, both these gentlemen got to work as soon as they reached Disco, and were successful in obtaining a dozen excellent negatives. So far, therefore, we may be quite satisfied with the attention which has been given to photography by the expedition. It may be argued that, after all, the Polar scenes will be very much alike, and that when a few landscapes (if they may be so termed) have been secured, all other photographs will be simply repetitions. This is, no doubt, true to a certain extent; but it must be remembered that if we are shown, on the return of the explorers, a series of pictures representing nothing but ice and snow in every phase, they will convey more than anything else a most vivid idea of the cold, desolate nature of the scenes in the vicinity of the North Pole. The photographs obtained will not, however, be less interesting than the pictures which Lieutenant Chermide, R.E., brought home with him after his return with Leigh Smith's expedition two years ago; and these, it will be remembered, were for the most part very fine. Those showing the wild coast of Nova Zembla were especially good; and if the expedition can only bring us back representations of the wonderful ice masses with which they are sure to be surrounded at times, the expense and trouble connected with the photographic apparatus will be amply repaid. And not only to the stay-at-homes will the pictures be of interest, but they will form afterwards the pleasantest souvenirs of those who undertook all the hardships, and be treasured up as reminiscences of scenes which may never again be revisited.

Unmounted Photographs in Commerce.—On his return from the East this summer, Dr. Vogel called attention to the almost universal custom that exists in Egypt and India of vending photographs in an unmounted state; and the learned Professor, after discussing the advantages and disadvantages of such a system, gave it as his opinion that there are many reasons why it is preferable to sell photographs unmounted. We see that the custom is growing in this country, and especially in tourist districts, where travellers are invited to purchase views of the natural beauties they visit. One of the advantages of this novel plan is at once apparent to the purchaser, for whereas a mounted carte picture is charged a shilling for (or, at any rate, sixpence), an unmounted picture cabinet-size may now be had unmounted for sixpence; and we doubt not that the photographer gets quite as much profit out of the transaction as before, while it is very certain that the public purchase a far larger number at this reduced rate. The unmounted prints can be rolled up, or put between the leaves of a book without inconvenience, and may then

be mounted in any way that is desired. It is rarely that a photographic album, now-a-days, suffices in a household for the reception of pictures, and many people have a scrap-album in which pictures of all sizes are mounted according to the owner's taste. An ordinary album will only allow for the reception of cartes and cabinets, and, therefore, no other photographs can be purchased than prints of these particular sizes. A scrap album, on the other hand, will admit pictures of all kinds, and unmounted pictures are, therefore, more welcome than mounted ones, the boards of which have simply to be thrown away, while much trouble also is required to separate the print from the mount. On the side both of the producer and the retailer, the traffic in unmounted prints is also more satisfactory. The producer would far prefer selling his pictures in the rough, rather than go to the expense of purchasing boards and mounting; and if any photographs turn out bad, there is only the albumenized paper lost, and the photographer saves both his mount and his pains. Besides, as the photographer rarely gets a profit on anything besides his picture, it is to his interest that the money received from the public should be laid out entirely in the purchase of his work, and should not be given for labour which a bookbinder could have supplied just as well; for of two similar amounts realised in the sale of mounted and unmounted photographs, a far larger share would flow into his pockets in the latter case. Finally, as regards the retailer, he is not less interested in the transaction. It is to his interest, in the first place, to please his customers, and if he can afford to give a photograph of double the size for half the price he would charge for a mounted picture, he will certainly do more business. In the next place, the mounts of photographs very soon get soiled from handling or remaining in stock, and this is scarcely ever likely to be the case. Objects such as unmounted prints could be kept more carefully than those upon Bristol boards, and in the event of bad mounts having been used—such, for instance, as contain hyposulphite of soda, as is not unfrequently the case—the dealer runs one risk the less. It may be said that unmounted pictures never produce so good an effect as mounted ones; but it would be easy to have a specimen picture of each kind mounted to sell from. On the whole, therefore, we think that the custom of selling photographs unmounted, if it becomes more popular in this country, will be to the advantage of the photographer as well as to the purchaser.

A Photograph from the Queen.—Her Majesty the Queen has presented Mrs. Tredwell, of Mincola, in the United States, with a half-length portrait of herself, in recognition of the return of a family letter which had come into Mrs. Tredwell's possession. The *Athenæum* actually announces this gift of a photograph, and, more wonderful still, further condescends to speak about it to the length of a quarter of a column. Our contemporary even says how the picture was framed, informing us that the photograph was "enclosed in a bronze frame, with finely-wrought bronze doors." The *Athenæum* does not go so far as to describe the photograph, nor does it discuss the artistic merits of the picture, but one of these days we shall hope to find details of this kind also in the columns of our literary contemporary; the matter, however, necessarily takes time.

A New Publication.—"Studies from Nature" is the title of a new work announced by Sampson, Low, Son, and Marston; it is to be edited by Stephen Thompson, and contain in each monthly number four photographs printed by a permanent process. The publication of something similar has several times been attempted, and the present work will have to be of a very-high class nature to be successful.

Swiss Landscape Photographers.—Mr. William England has proved a good master to Swiss landscape photographers. Ten years ago by far the majority of paper

prints of any value that one met with in Switzerland were the production of Mr. England, whose soft, clear productions were a marked contrast to the hard, black-and-white pictures of native photographers. We are glad to see that recently the Swiss photographers have made considerable progress in this branch of their art, and good photographs are now prepared at nearly all the Swiss towns visited by tourists and travellers. At Zurich and Lausanne, and especially at Geneva—those of Charnaux, for instance—pictures of Swiss scenery may now be obtained which reflect much credit on Swiss photographers, who have been rather a long time learning to turn the beautiful scenes near their homes to account in this way.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XVI.

THE PRINTING, SENSITIZING, AND TONING ROOMS.

EVEN in galleries well fitted in every other respect, the printing department is one too often not properly considered, the general opinion being that almost any place is good enough. Why this should be so I cannot quite understand, unless it is that in general the department understood and practised by the proprietor is that of the skylight and dark room, and of consequence ranking first of importance in his estimation. It is needless to say, that although fine work is undoubtedly done in printing under tremendously disadvantageous circumstances, it might easily be surpassed under better conditions. The position of a printer in some establishments is no enviable one; frozen in the winter, and roasted in the summer, and at all times labouring under the disadvantage of performing all kinds of manipulations in one cramped room. I do not now intend to raise a plea for the "poor printer." The worker is not a being to be studied. Pray, is he not paid? But the quality of the work, and the reward for any rise in the standard, is, I am sure, an argument that will be recognized by all. To the photographer who desires to take a front place in his business, completeness in all his arrangements is entirely necessary. Of course, much depends on this, but it is certainly a point that deserves consideration, if your business is to be successful.

The manipulations should be kept apart to ensure success, and though, as I before indicated, much very good work is done in the worst and most inconvenient printing rooms, I maintain that three separate rooms should be exclusively set aside for printing, to the uses of sensitizing and drying the paper, the printing of the negatives, and for toning, &c.

THE SENSITIZING AND DRYING ROOM

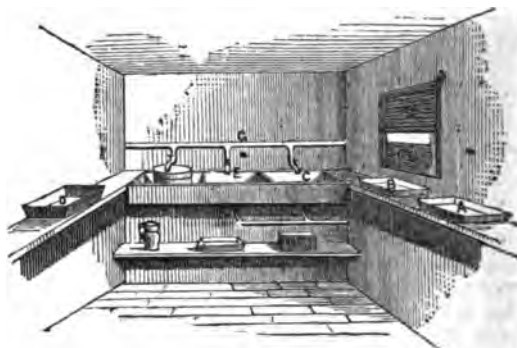
is a dark chamber, lighted with gas. It should be fitted on one side with a convenient shelf or table on which to rest the silver sensitizing dish. On the opposite wall should be fixed an open rack, fitted with clips for holding the sensitized paper. This rack is merely a light frame with bars running across at a distance apart of about six inches, and to these bars the paper clips are affixed, so that when the sheets of paper are hung for drying there is little danger of their being blown together and sticking to each other under the influence of any slight draught. The rack is suspended about four feet from the floor, so as to be easily got at. Under it may be affixed a row of gas jets to dry the sheets, or more economically, but more slowly, the drying may be effected by means of a stove.

In this room the filtering of the bath may be done—not the boiling, as that may be more suitably done in the toning room when in disuse, or in some convenient place that may be found for renovating the baths, both negative and positive; but the ordinary filtering and strengthening of the baths may very properly be carried on in the

silvering room without hurt. Provide large white bottles to hold the bath, funnels for filtering, filtering paper, a graduate and hydrometer for purposes of testing the strength of the solution, litmus paper, and a paper knife. For these there should be found convenient places in which they may be kept and found.

THE ROOM USED FOR TONING, ETC.,

is more extensive in its fitting, and should be so designed that while being quite convenient for working, dangerous agents should be as far apart as possible—as for example, the fixing solution, hyposulphite of soda—from the toning bath and unfixed prints. In the design given this has



been done, it will be found. A is the dish in which the washed prints are in place near the toning dish B. The window at back of the toning dish is fitted with dark shades, S, and (S) to regulate the light, which must be weak and diffused, to save the prints from discolouration. Toned, the prints are placed in a dish at C, thence they are placed in the hypo dish D, which is quite distant from all other dishes, as splashes from it are quite fatal to the prints. When properly fixed they may be washed in the trough marked E, and then placed in the tub F, and thoroughly washed. This tub is fitted with a perforated false bottom, so that the prints may be perfectly washed in all parts. The tap and waste pipe are so arranged that a certain quantity of water may always be retained in the tub, although there is constant change of washing water, it being necessary to thoroughly eliminate the hypo from the prints. The arrangement of water and waste pipes can be understood from the sketch; G, supplying the washing water; the waste pipe carrying away the washing of the prints before and after toning, runs into a tank and is preserved; those of E and F running to waste as being hardly worth preserving for reduction for the silver, the percentage being very small. The toning room may also be used for various purposes. Baths may be boiled here, but not if a convenient place elsewhere may be found, the potash and acid dishes for removing collodion films from old used negative glass, and for other operations.

THE PRINTING ROOM.

This room should be so designed as to allow of the printing to be carried on within the apartment in stormy and cold weather. A shelf fitted from a large window, and the sash built out to cover it as a protection for the negatives against frost, snow, and rain, will save much time that would otherwise be wasted in unpropitious weather, paper wasted in the advent of an unlooked-for storm, and many negatives broken by exposure to the changes of temperature.

Outside, on a roof or ledge, are built stands for the reception of the printing frames, both of sunshine and shaded aspects, to suit the varying character of the printing clichés.

The stands are built with sides sloping at an angle of (say) forty-five degrees, with ledges, so that several rows of card printing frames may rise one above the other.

Adjacent to the roof used for printing, on which the stands are placed, is the printing room, fitted with the window for indoor printing, described above. It should be furnished with convenient drawers for sensitized paper for printing, and the prints themselves. These drawers should be so arranged as to admit as little light as possible when they are opened for the purpose of extracting paper, in the case of the sensitized paper drawer, or with that for prints, on placing a finished print therein, as discolouration of the paper or of the prints ensues on the entry of light. To further prevent this, the drawers might be fitted with sectional lids inside, so that even when drawn out the light cannot penetrate. Drawers, also, for unsensitized paper, plain and albumenized. Shelves running round the apartment to hold the stacks of negatives in use, catalogued either under letters or numbers; the former, of course, is to be preferred, there not being the necessity for constant change, as in the case of numbered negatives, which are always progressing. On this point, however, there may be prejudice in some minds against the name of the sifter being attached to the negative.

The *Fuming Box* may be kept in this room. I shall not discuss the *pros* and *cons* of this troubled question of fuming. Certainly, in many cases it is very advantageous, and, I believe, generally, the paper prints richer, more brilliantly and rapidly, and tones more easily and with better results.

The box is constructed to hold several sheets at a few inches apart. A false bottom about six inches from the bottom of the box is perforated with holes, and underneath it is a drawer in which the ammonia dish is placed. The utility of the drawer is that the dish can be placed in the centre of the box, on its being shut up, whereby more even fuming can be ensured.

The *Temperature of the Printing Room* is a matter that should be looked to. A stove in the winter and ventilation in the summer should keep the apartment at an even and comfortable temperature all the year round.

General Remarks.—The printing room should be kept scrupulously clean, and as free from dust as possible. A bench will be found useful for many purposes, as filling the printing frames, making printing openings for the negatives, stopping out, cutting prints, &c. A box or basket should be kept for the reception of silver paper cuttings, as they are preserved, burnt, and reduced for the extraction of silver.

PHOTO-MECHANICAL PRINTING.

BY E. BIERSTADT.*

As Mr. Albert's process has thus far produced the most durable plates of all, it may be interesting to explain how this durability is best attained.

The action of light on a chrome gelatine film is by far the most effectual means of hardening it, but if it is subjected to the light long enough to make it perfectly non-absorbent, the hardening will penetrate to a depth that will interfere with the qualities desired for the otherside. To avoid this difficulty the film is composed of two layers. A plate of glass is coated with a mixture of gelatine, albumen, and bichromate of potash, then dried and laid face down on a dark cloth and exposed to the light. Then the hardening begins, the black cloth absorbs the penetrating rays of light, and prevents the hardening from going too far. At the proper moment the plate is removed and washed, to prevent any further action; the outer surface is still sufficiently adhesive to unite with another layer of sensitive material, which is now flowed over it in the same manner as the first; when this becomes dry it is placed in contact with a negative and exposed to light in the same manner as an albumen print.

The action is watched from the back, and is finished when all the details are just visible; if the solution has not had the coagulating material mixed with it, it can now be immersed in a solution of alum, chrome alum, tannin, or their equivalent, after which it is washed for a short time in clear water, and is then ready for the press, or it can be set aside for future use.

To print from such plates, after bedding in plaster of Paris in a press, the surface is sponged over with water for a minute, then wiped with a clean cloth, and a roller charged with thick printing ink passed over it in all directions until the deepest shadows are sufficiently inked (but little or none should be seen on the middle tints); then a second roller with a thinner ink, black or tinted, is rolled over in the same manner, which deposits on the half tints. After the inking is complete, a mask is laid over the plate to preserve a clean margin, and the impression is taken.

Notwithstanding the rough usage to which it is subjected by leather rollers, with stiff ink, the scraper of the lithographic press, or the iron roller of the copper-plate press, continued sponging and wiping, washing with turpentine, &c., a single plate has been known to yield over four thousand impressions.

As soon as the Albertype became known, other experimenters came forward with what they called improvements, but so far have made neither better prints, nor more durable plates.

In 1869 Mr. Max Gemoser announced a method of making improved printing plates, and joined in the firm of Ohm and Grossman in Berlin. His formula was kept secret, but in 1870 it was published in a pamphlet, and proved to be a method which was in part communicated to him by Mr. Albert; it was to add a resin to the chrome gelatine, and heating the plate in an oven to melt the resin on the surface in contact with the plate, whilst the upper surface was protected with a layer of flour; instead of using the simple bichromate gelatine he added seventeen other substances. After this process had been practised about six months, Messrs. Ohm and Grossman sent a circular to their pupils describing the Albert method of hardening the under side of the film by light, and recommending the adoption of this plan as being the best. As it may interest the curious, I will give the Gemoser or Ohm and Grossman formula in full, which is as follows, viz.:

"Solution No. 1.

Gelatine	...	...	1 part
Distilled water	...	...	8 parts

Solution No. 2.

Gum myrrh	...	...	30 grains
Gum ammoniac	...	...	20 "
Liquorice root...	...	...	58 "
Manna...	...	...	20 "
Beet sugar	...	...	10 "
Milk sugar	...	...	10 "
Water	...	...	2 ounces

Mix and set aside for twelve hours.

Solution No. 3.

Bichromate of potash...	...	1 drachm
Bichromate of ammonia	...	1 "
Water	...	2 ounces

Solution No. 4.

Liquor ammonia
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Solution No. 5.

Lupulin	...	1 drachm
Gum myrrh	...	1 "
Gum benzoïn	...	36 grains
Tolu balsam	...	24 "
Spirits of wine 90 per cent.	...	3 ounces

Solution No. 6.

Nitrate of silver	...	5 grains
Water	...	1 ounce

* Continued from page 418.

Solution No. 7.

Iodide of cadmium ...	...	4 grains
Iodide of zinc ...	...	4 "
Bromide of potassium ...	...	4 "
Distilled water...	...	1 ounce
Gold solution, 1 to 10	...	3 drops

Solution No. 8.

The white of one egg...	...	1 ounce
Water ..	...	1 ounce

The solution for coating the plates is composed of 16 drachms of No. 1; 1 drachm of No. 2; 80 grains of No. 3; 2 drops of No. 4; 30 grains of No. 5 after shaking; 5 grains of No. 6; 10 grains of No. 7; 2½ drachms of No. 8. Mix well, and warm to 40° Reaumur, filter through flannel, and flow over the plate previously warmed. After the plate has been dried by a moderate heat, it is impressed with a picture through a negative, and then washed in water and dried; it is then covered with a layer of flour, and heated in a muffle for one or two minutes to a temperature of 80° Reaumur. This operation is for the purpose of coagulating the albumen, while the covering of flour protects the gelatine from injury by the heat. The plate is then allowed to cool in the muffle."

The pamphlet containing this, and also the Albertype process, was published in Prague, and was considered by Messrs. Ohm and Grossman to be an infringement of their copyright. This resulted in a lawsuit against the publisher, and an injunction against the sale of the pamphlet, but the jury decided in favour of the defendant, Mr. Steinhäuser, and condemned the plaintiffs to pay the costs, and removed the injunction on the pamphlet.

In this trial an attempt was made to prove that Gemoser was the inventor of the "Lichtdruck," a name given to photographs in printing ink in half-tone; but it was shown that Mr. Albert had made them in a much simpler manner two years earlier than any record he could bring.

(To be continued.)

THE PRACTICAL PRINTER IN AMERICA. XXXVII.

SELECTION OF THE PORCELAIN PLATES.

PORCELAIN printing is the most difficult of the three parts described in this book, both to the experienced and to the inexperienced printer. I think that if the advice which I give in the following chapters be faithfully carried out the difficulty will entirely disappear.

The foundation of porcelain printing depends upon obtaining fine porcelain plates, which is by no means an easy thing to do. A little advice as to the kind of glass the beginner should select will perhaps be of value.

Do not accept, in the hopes of making a great bargain, porcelain glass which may be offered to you at a great discount.

There are various sizes of plates which the beginner should provide himself with, and all of these sizes are either ground or polished. The ground plates are intended to be used when the porcelain is to be worked up either in water colours or in oil; the polished plates more for uncoloured work.

In selecting your plates, see that they are flat, and if there is a side that is convex, then see if the surface of the glass is smooth, for that is the side of the two which is to be used to print on. If the convex side of the plate is rough, as it will be if it is not polished properly, then reject it.

To determine whether the glass is flat or not, hold it up before you, and look along the edges of both its length and width. If the plate is a little uneven, and you think that by a little care you can so arrange it on the printing-board that perfect contact will come between the negative and plate, then save it.

Another thing in selecting the plates is to see if they are
and
of the

thick, which is very important, especially for anything larger than a half-size, for thin porcelain plates often break from their own weight alone; in fact, always use the best plates that you can obtain, and one good step towards success will be taken.

CLEANING OF THE PORCELAIN PLATES.

Cleaning New Plates.—Wash the plates thoroughly on both sides under a tap of water, and place them for the time being in a rack.

The object of washing them first is to remove all of the dirt which may happen to be on them.

Now, to get the plates "chemically clean," they are placed in a suitable size tray of photographic ware, which contains a solution made of commercial nitric acid one ounce, water four ounces. Let them remain in this acid bath for a day or so, and then they are ready to be removed and washed for albumenizing.

Cleaning Old Plates.—For the purpose of cleaning old dirty plates which have been used before, whether varnished or not, they should first be placed in a bath made of concentrated lye one pound, water one gallon. Let them remain in this bath until the film may be easily removed by running water, which will probably be in a day or so. When this time has arrived, then wash well under the tap until all of the varnish and film is removed, and then place them one by one in the acid bath as described above. Keep the old plates in the lye until all of the film is removed, and never place them in the acid until that time arrives.

In placing the plates in either the lye or acid, always place them in, one by one, so as to allow the solution to pass over one plate before another one is placed on it.

Never place large and small plates in the same solution at the same time, unless all of the large plates are at the bottom; for if they are mixed up, first large and then small ones, the weight of the upper plates will cause the unevenly supported plates below to break, and it is also a very difficult thing for the beginner to take them out, when so mixed up, without breaking a number of them.

It would be a good thing to lap the edges of one plate over another in the solution, as the solution will pass between the plates better.

Both the strength of the lye and acid will need to be renewed every month or so.

Before placing the plates in either the lye or acid solutions, scrape the edges of them together, and in the future treatment of them you will most probably derive a benefit, as the collodio-chloride will be more likely to keep on the plate during the toning, fixing, &c.

Ground plates are generally very difficult to clean, even if the above advice is strictly followed out, and I very often clean them after they are removed from the lye and washed and while still wet, by sprinkling a little powdered emery on that side which is to be used for printing, and grinding the surface evenly by means of a flat side of a cork.

Ground plates which have been purchased, and are unevenly ground, can thus be made excellent by a very little trouble.

When the grinding is finished, wash them well under the tap, and place them for a day or so in the acid bath.

ALBUMENIZING THE PORCELAIN PLATES.

The porcelain plates are now to be albumenized, and for this purpose procure three large fresh country eggs, which you are to crack and carefully let the albumen (the white part) into a large clean china bowl, being careful not to let any of the yolk (the yellow part) of the eggs into it, and if by accident a trifle of it should get in, then remove all traces of it by the use of a spoon.

Pour the albumen into a clean graduate and note the number of ounces of albumen, and add more of pure

Th... average an ounce ... ch.

Pour the diluted albumen back into the bowl, and then place in it a dozen drops of strong aqua-ammonia, and with an ordinary egg-beater beat the whole up to as stiff a froth as possible. This should be well and carefully done. Let settle over night, covering the bowl over with a glass. In the morning decant the solution—leaving the froth in the bowl—into a clean bottle, or another bowl, and filter what you need into a thoroughly clean four-ounce vial, or, better still, into a tiny tea-urn, which has a nose leading to the bottom part of the ware, for then in pouring the solution out there will be no bubbles, for they are at the surface if there are any at all.

A good plan, whether you may have the toy tea-urn or not, is to let the lower part of the funnel rest against the inside of the vial, thus permitting the albumen to run down the side, breaking the fall of the filtered solution, and thus preventing bubbles from being formed.

Filter through one or two thicknesses of good filtering paper, and if the albumen is not clear, then filter until it is.

Always keep enough ammonia in the solution for it to continually give forth a slight odour.

I have recommended the albumen solution to be used quite thick, as the film on the plate will not be near so likely to be removed in the subsequent operations of the porcelain print, which is so very troublesome both to the beginner and to the "old hand."

The plates are now to be removed, one at a time as they are wanted, from the acid, and held up to the light, and the edges of them looked at to determine the convex side of them, if there is any; but if there is not, then choose the best of the two sides, and proceed to wash thoroughly under the tap, rubbing the sides and edges of the glass well with a mat, so that the fingers, which are often a little greasy in spite of your precautions to the contrary, may not come into contact with the face of the porcelain.

Hold the glass while it is washing by the edges or extreme corners, and when it is sufficiently washed take it out of the dark-room (where you albumenize the plates) to see as to whether it is fit to be albumenized, and if it is, then give it a final rinse with filtered rain-water (filtered as it comes from the tap), and then carefully pour the albumen solution on the upper part of the plate, midway between the two corners, and let it flow over the plate, first to the upper left-hand corner, then to the upper right, next to the lower left (which is the corner by which the plate should be held), and finally carefully pour off at the lower right-hand corner into another bottle.

Do not pour on but a little more albumen than what will cover the plate, and before using again the small quantity that may have been left after you are through albumenizing, it should be filtered.

Now place the plate which you have albumenized, still holding on at the same corner, either in a rack, or upon two nails, to dry, letting the drops fall upon blotting-paper, so that their fall will not raise a cloud of dust. Permit the plates to dry spontaneously.

SUGGESTIONS FOR THE SEASONS.

BY E. J. CHUTE.*

THE time is fast coming when the occupation of the lazy, indolent, dirty, careless, cheap picture-maker will be gone; and may the days fly swiftly on, till, photographically, he shall be numbered with the past. But to him who has an earnest love for nature and the beautiful, whose whole soul is filled with enthusiasm that impels him to strive for the highest and best, who spurs no pains, omits no precaution, whether in the gallery or in the field, to secure the best possible impression of the subject before him—to this man the future opens to an illimitable field of progress, wherein he is sure to expand his powers, and rise to the highest attainments of his art. Young men in photography, of these two pictures, which will you choose?

Too strict an adherence to rules and formulae is an evil

from which every operator should seek to emancipate himself. The conditions are constantly varying. The subject, the light, the different sizes of plates used, the temperature—all these call for variations in the several departments of the work; and he who studies these changes, and endeavours to accommodate himself and his methods to them, will soon find his capabilities expanding, and learn that success is not so much due to the excellent formula his friend gave him, which was good as a formula, but to his own intelligent use of it.

As the warm weather comes on, photographers must look to their solutions. Not only must they not be made so strong as in cold weather, but they will require attention to see that they do not become too strong by evaporation. This is very apt to occur with the printing silver bath; the bulk is reduced by evaporation faster than the strength is by use, and evils arise in the paper from over-silvering, or the excessive strength of the bath. A bath that may be used at 50 grains in winter will not require to be more than 35 or 40 in summer. The printing bath should also be kept cool. A good plan is to return it to the bottle after use, and set it in a cool place or in a tank of water till again wanted. The paper turning brown after silvering is often a result of the bath being heated, and is at the same time too strong. All solutions are more energetic when warm, and when heat and strength are combined, they are very likely to become unmanageable.

The negative bath is not affected unfavourably by a high temperature, such as may be communicated by the weather, provided the strength is kept down to not over 30 grains to the ounce.

The collodion is the most readily affected unfavourably by heat of any of the dark-room chemicals. It is not advisable to change the strength of the collodion, but it must be kept cool. The most effectual method of doing this is to keep the bottles in cold water. Without these precautions and modifications, as warm weather approaches the unthinking photographer will be pestered with over-exposure, fog, streaks, network in his films, unmanageable development, &c., besides the train of evils that will follow in the printing department from the same cause; but they are all quickly remedied when once his eyes are open to see. The best work of our best artists shows us what photography is capable of. Each man's work is usually an index of his capacity, and by it he must rise or fall. There is getting to be so much art knowledge diffused among all classes of people now—and nothing has done so much to promote this as photography—that the public are not slow in discriminating as to a man's ability; so that if one wishes to bear the title of artist, and make himself a reputation as such, he must qualify himself so as to be able to prove by his work that he has the capacity to lead in his vocation, and to command the confidence and patronage that are sure to be bestowed upon him who produces works of art.

When a photographer finds his work deficient in any respect, let him not think he requires some new formula or new apparatus to set him right; the deficiency is probably in himself; and if he will but set about improving his own stock of knowledge, enlarging his own capabilities in the direction that he sees it necessary to improve, he will, no doubt, be surprised at the change that will come over him in a short time. Every talent is developed by use, and the more the powers of mind or body are exercised within reasonable limits, the stronger they become. It is this self-discipline, self-culture, in any particular direction, that will enable a man with but little effort to overcome difficulties that before appeared insurmountable.

Every photographer should be careful of his health. The dark-room is the most trying department of the business; this room should therefore be large, high-studded, and well ventilated. All fumes should be avoided as much as possible; every bottle should be kept well stoppered, and no volatile or poisonous chemicals allowed in the dark room that are not absolutely necessary. Health is better than wealth.

* *Photographic Times*.

The Photographic News.

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MR. JOHNSON'S DISCOVERIES IN THE CARBON PROCESS.

IN the course of a correspondence appearing in our pages during the last two or three weeks, a question of historic fact has arisen in relation to the origin of certain distinctly progressive steps in carbon printing. A pamphlet has recently been issued by Dr. Van Monckhoven on the history of carbon printing, the essential aim of which, as avowed in the opening sentence of the preface, is to inform professional photographers as to the real value of certain patents connected with carbon processes. In this historic resumé the contributions of Mr. J. R. Johnson are treated, on the one hand as of doubtful value, or, on the other, as of less than doubtful originality. In this country, where the improvements were first announced, and demonstrated to the keen delight and intense interest of many admiring audiences at photographic societies, the name of Mr. Johnson stands in honourable conjunction with that of Mr. Swan, as the names of two men who made carbon printing practicable and commercially possible; and Mr. Johnson not unnaturally protested against the position assigned him in a pamphlet published in the language of the country of which he has become a resident, and where, as we regret to learn, he finds it necessary to resort to litigation to maintain his property in his discoveries and inventions.

With the personal elements of the controversy between Mr. Johnson and Dr. Van Monckhoven we have nothing to do. In all discussions it is a dangerous thing to wander from the fact or the statement to search for or attribute motives. Mr. Johnson believes that Dr. Van Monckhoven has special motives for underrating his claims, and the latter disclaims all motives but historic truth, and expresses his willingness to be corrected in any point in which he may have been led into error; and it is on this ground, having a high personal regard for both gentlemen, as well as for historic truth, that we feel it desirable to say a few words on the facts; and we may add that as we have been the weekly historian of carbon printing in all its phases from the time when Mr. Swan communicated his discovery for first publication in these pages, and not only historian, but experimentalist, having tried, probably, every modification and improvement which has been proposed, with all due modesty we claim some right to speak on the subject.

Into the general estimate and examination of Mr. Johnson's claims published by Dr. Van Monckhoven we shall not enter. As we said last week, in our view these claims are seriously misappreciated. But it is as to the originality of certain of these claims, upon which Dr. Van Monckhoven casts doubt in the extract from his pamphlet which he gave in his recent letter we feel bound to offer a few comments.

Dr. Van Monckhoven has not had access to original documents, but derives his information from a translation, not improbably an abstract of the original, from which he comes to the conclusion that in the principal element of Mr. Johnson's process the adhesion of the exposed carbon tissue to glass, metal, or any air-tight or impermeable surface, by atmospheric pressure alone, without the aid of any adhesive preparation, had been forestalled and previously published by Mr. W. H. Davies in a paper read before the Photographic Society of Edinburgh in 1864. Mr. Johnson's patent included many improvements which it is not necessary here to consider; but this principle of adhesion by atmospheric pressure or suction was the cardinal novelty which arrested the delighted attention of every one interested in carbon printing. Such an idea had never been even remotely hinted before. For five years, since Mr. Swan's great improvement, carbon printing had been steadily practised, and admirable work done in the establishments of Mr. Swan and others; but the troublesome and unhealthy plan of covering large sheets of paper with a solution of india-rubber in benzine to provide a temporary mount upon which to develop the print—using a costly machine to give enormous pressures, to effect the mounting—had been universally employed. Mr. Johnson discovered that if the gelatine surface of the carbon tissue were partially saturated with water and gently pressed into contact by the aid of a squeegee, with an impermeable smooth surface like that of glass or a plate of metal, perfect adhesion was secured. The principle was so new when first enounced, that considerable iteration and practical demonstration were necessary before the mass of photographers actually received and comprehended the idea. Then was seen at once the simplicity introduced into the working; breathing the unpleasant and unhealthy fumes of benzine was no longer a necessary contingent of carbon printing; a rigid support removed the risks of tearing attendant upon the production of large pictures. All the difficulties of applying a new principle had to be met by Mr. Johnson, who, fortunately, added to a high culture as chemist, physicist, and mechanic, a singularly inventive capacity. The precise amount of immersion of the tissue was determined by its mode of curling: the "safe edge" had to be devised; the properly prepared zinc plates had to be secured; the precise treatment of the surface with a fatty or resinous body, to prevent final adhesion of the tissue to the surface upon which it was developed; and an infinity of minor points necessary in the successful application of a new principle, in a direction where so much experience had to be acquired. Mr. Johnson effected this, and his principle, with but slight modifications, has been universally adopted ever since. The startling character of the innovations—the delight with which it was received when once understood—the readiness with which it was adopted wherever carbon was practised—the extensive impulse to extended application of carbon printing which the discovery gave, were facts transpiring in this country, and perpetually under our eyes, and our observation of the facts impressed us, doubtless, much more emphatically than the mere echo or record could impress a foreigner in Continental Europe reading the details, either in the English journals or translation.

Dr. Van Monckhoven has met with some account in a French journal of a paper read by Mr. Davies to the Edinburgh Society in 1864, and in the experiments there described he thinks he sees the germ of Mr. Johnson's great improvement, as well of another claim in his patent. It is true that the principle was not claimed by Mr. Davies, and that it is not in fact named in his paper; but Dr. Van Monckhoven thinks it is involved in it. A very brief glance at the original paper, which is before us, will show that it is not only not involved in it, but could not have been. We may remark, *à passant*, that soon after we had published details of Mr. Swan's process, in the spring of 1864, experimentalists

themselves to trying various novelties in the same direction. Mr. Davies, an ingenious experimentalist, read a paper before the Edinburgh Society on the sixth of July, describing carbon experiments he had made some time before, but had not published. These experiments were ingenious and interesting, and we remember trying them as soon as the details were published; but they in no sense involved Mr. Johnson's principle, and had no real analogy therewith. We will quote the necessary details from the original paper, and show the difference between the method of Mr. Davies. The latter makes his tissue upon paper prepared with albumen and starch; but we will assume, for argument's sake, that he uses an ordinary tissue, similar to that used by Mr. Johnson. He exposes, and then develops, and it is here the question of similarity arises. He says,—

After exposure—which I generally time by exposing a bit of clean bichromate paper till it is well coloured, then expose a second bit, and when it is also coloured the print is fully done—I now remove the frame into the dark room; remove the print; soak it in water for a minute; give it a shake to remove superfluous water; then rapidly pass a rather larger bit of albumenized paper through the water; place them both in close contact, and roll on plate glass with a thickness or two of blotting-paper above and below. It is essential to the success of the transfer that not a single air-bubble, however minute, be left, otherwise it will make a hole in the resulting proof.

The back of the damp albumenized paper is now wetted with spirit of wine, and again rolled and hung up for a few minutes before the fire to dry. When dry it is placed in warm water, and the first paper comes off in a few minutes; and immediately, if the exposure has been right, the picture begins to develop.

In these operations, Dr. Van Monckhoven sees the idea of adhesive atmospheric pressure. A moment's careful examination will show that was not only not contemplated, but was impossible. Mr. Davis takes a piece of ordinary albumenized paper with the surface wetted, and brings it into contact with the wetted tissue, and presses them together. This piece of wet albumenized paper is not an impermeable or air-tight surface, such as is absolutely necessary in securing atmospheric adhesion; it is simply a sticky surface which adheres in virtue of its glutinous character. Dr. Van Monckhoven refers to the suction of the gelatine ensuring "a vacuum which makes it adhere to the insoluble film." But the albumenized film is not insoluble; it is perfectly permeable by air, and adheres in virtue of its stickiness solely. Afterwards, it is true, the back of the albumenized paper is moistened with alcohol to render the albumen insoluble, but the object of this is to prevent the solution of the albumen, and the consequent floating away of the image during development; not to secure a vacuum, as the adhesion has been secured by other means. And it is very doubtful indeed, even if the idea has been entertained, whether albumenized paper treated with alcohol would give a surface so impermeable to air as to secure anything like atmospheric pressure.

The process described was a single transfer process; but Mr. Davies had another for double transfer. Here it is as described in the original paper:—

The picture, if taken from an ordinary negative, is reversed, and if it be not desired that it remain so I proceed a little differently. I take, instead of the albumenized paper, a thick solution of shellac and Venice turpentine in spirits of wine (methylated) in about equal parts, and attach the printed surface to a bit of common paper by rolling the two together with the lac paste between, allowing to dry, and proceeding as I have stated for the albumenized paper; and, after development, I saturate a bit of blotting-paper of the same size as the print with methylated spirits, and place it in contact with the second paper (having previously gone through the albumenized paper method with the developed surface), and leave it between two surfaces of glass for a quarter of an hour or more, when the cemented surface will easily leave the picture, and a slight wash with a sponge dipped in spirits will make it clear.

Here it will be seen we are just as far as ever from atmospheric adhesion. The tissue and the paper upon which it has to be transferred for development, are cemented together with "lac paste," and after development is completed the cement is dissolved by means of methylated

spirit. Here is a close analogy between Mr. Davies' method and Mr. Swan's method of cementing with india-rubber paste, and dissolving with benzine; but no analogy whatever with the method of Mr. Johnson, as we are satisfied our friend Dr. Van Monckhoven will see now that the original text is before him.

The fact that Mr. Davies used a paste of shellac and Venice turpentine in methylated spirit has so little in common with the use of lac dissolved in an aqueous solution of an alkaline salt in preparing a transfer paper with a surface insoluble in water, that it is unnecessary to comment on the matter.

In aiming to secure perspicuity our remarks have extended further than we intended; but we have adhered closely to the argument, carefully avoiding epithet, or anything which can savour of personality or give pain. We feel sure that Dr. Van Monckhoven will readily accept the correction offered in a frank fair spirit. We have felt the duty of making such correction incumbent upon ourselves, as possibly there are few to whom opportunity and choice have afforded such perfect means of knowing the history with such detail and precision.

OLD DIAMONDS FOR MODERN SETTING.

BY W. E. BATHO.

WHATEVER very aptly compares discovery to the labour of the man who digs blocks from the quarry, and he who uses such discoveries to the builder who with such blocks raises a flight of steps, to enable his fellows to reach a greater elevation.

That there are many such blocks (rough hewn they may be), lying scattered on the field of photography, awaiting the hand of the builder, cannot be doubted. It needs but little reflection to call to mind a multitude of facts which form no part in any modern process, and lie looked up in the records of the past, probably forgotten by many, certainly unknown by a greater number. I propose naming a few of them in the course of a little time, figuratively performing the office of the carter who shoots a load of hewn stones at your door for building purposes. In the way of a commencement, I venture to bring before your notice an unused method of carbon printing, pointing out wherein I conceive failure has been caused, and further indicating a new application of the same process.

In the latter portion of 1859 Mr. Poitevin published a process, based upon the reaction taking place between gelatine, perchloride of iron, and tartaric acid. In the early part of 1862 the same gentleman made this modification:—Gelatine, with sufficient colouring matter, was impregnated on both sides with

Perchloride of iron	...	...	3 parts
Tartaric acid	...	...	1 part
Water	...	...	80 parts.

Such tissue is then insoluble, and becomes again soluble on exposure to the action of daylight.

In the middle of 1864 Mr. F. Eliot suggested the use of this process for direct carbon printing, a white pigment being used on a black paper. From this to the present time I think I shall be correct in saying no further use was made thereof, save and except it be a suggestion for its use in the reproduction of negatives without the use of a transparency.

It is not my intention to enter into the chemistry of the process at present, but to name the mechanical difficulties that I believe have operated unfavourably, and produced unsatisfactory proofs. That all difficulties of transferring would be got rid of in this process is obvious, and it does seem strange that so valuable an invention should be unused. Inasmuch as those portions of the tissue upon which the light acts are the parts dissolved away in the process of development, it is clear that the parts not dissolved are those that form the picture; it but remains for me to point out, if success is to be obtained, the necessity

of using a tissue having a *uniform thickness of coloured gelatine* over the support; because the action of light is proportionate to the lights and shades of the positive or negative employed. Such lights and shadows would be represented on the film by solution of the coloured gelatine, and would have no relation to any inequality in the tissue itself, although such inequality would be fatal to a correct representation of a portrait. Therefore, a tissue devoid of irregularities is a necessity in this process, if it ever be employed for direct carbon printing.

I now come to the new application before mentioned. The printing in fatty inks is a process for which photographers are greatly indebted to M. Despaquis. He very clearly mentions in his recent patent the necessity of avoiding an intermediate layer of soluble gelatine between the printing surface and the support. The process above named would ensure these conditions in the most perfect manner, because the whole film is insoluble when commencing, and such portions as become soluble depend entirely upon the positive employed. While distinctly affirming that I have no interest whatever in any process now existing, I would advise my professional brethren to give a little more than passing notice to the beautiful mechanical appliances M. Despaquis has brought to bear on the production of photographs in fatty inks.

A PHOTOGRAPHIC TRIP TO ARRAN AND THE HIGHLANDS OF SCOTLAND.

BY REUBEN MITCHELL.

BEING fully equipped with camera and sketching materials for a tour in Scotland, I left Bolton on 12th of July, and arrived in Glasgow in the evening, resting for the night at the Windsor Hotel. Next morning I started by train for Ardrossan, and crossed the Channel by steamer to Arran, where I arrived after a very pleasant sail of about an hour, and landed at Brodick, but having a considerable amount of luggage it caused some delay. The bus to Corrie, my intended destination, being soon filled, I had to engage a machine, the name given to all classes of conveyance on wheels in several parts of Scotland. The small bay at Brodick is very beautiful; along the road side on the coast is well wooded with stately firs and other trees. There is a good hotel, with a fine view of the sea. My luggage was soon stowed on the conveyance, and I started for Corrie, where a kind friend had made arrangements for me beforehand. The distance from Brodick to Corrie is about seven miles, along a broken and picturesque coast—trees, scrub, and mountain on one side of the road, with old red sandstone rocks, washed into all sorts of curious forms along the shore, with large numbers of granite boulders, some of immense size, scattered all along, and partially covered with beautifully covered coloured seaweed, which forms innumerable pictures for the camera and pencil of the artist. The hotel at Corrie is small, but comfortable, and situated on the shore, with a good view of the sea, the hostess, an excellent business woman, attending promptly to the requirements of her visitors. I took a stroll after some refreshment to North Glen Sannox, very beautiful and varied in character, with a rugged burn or stream winding its way through rocks and boulders to the sea. I here found my friend sketching the beautiful and rugged rocks of Sannox. I returned to the hotel, and made ready for commencing operations on the following morning, with camera and water-colour sketching combined, the weather being most favourable for camera work. The stillness for so long a time was most remarkable, scarcely a breath of wind for weeks together. It enabled me to take a large number of photographs of some of the most beautiful scenery in the island in North Glen Sannox. Commencing at the bridge, I made a large sketch of the burn and glen in water-colours, together with a number of photographs of what I considered the choicest bits in the glen. This glen sup-

plied me with subjects for several days. Myself and two artist friends made a trip to Lochranza through Glen Sannox, and descending through Glen Chalmidell, very steep and romantic, with a mountain burn tumbling through its rocky bed, and gliding into the loch. The sides of the mountain are studded with a few primitive cottages, some nestling among trees. The descent is a very pleasant one, and presents many grand views. On emerging from the glen, the village and loch appear tame in comparison with the wild character of the mountains. It is a small fishing village scattered along the coast, with an old ruined castle almost surrounded with water, supposed to have been a hunting seat of the Scotch sovereigns about 1880. On the shore are several stranded boats and old fishing smacks, some condemned and decaying. These and the castle formed subjects for my camera. In the bay there was a fleet of picturesque herring fishery smacks, painted various colours, giving quite a gay appearance to the bay. After partaking of refreshments at the village inn, we returned to Corrie. Having done North Sannox, I next visited South Glen Sannox, very different in character to the North. Looking up the glen from the coast, the dark towering peaks of the mountains have a very imposing appearance—on the left is a singular conical peak called the "Maiden's Pap." The lower portion of the glen and burn sides is thickly wooded with scrub and graceful birch trees. The burn is charming and wild in the extreme; the water tumbling over large rocks and boulders from pool to pool, forms a series of fine pictures. I secured a number of photographs from the bed of the stream and other parts of the glen, also several sketches in water-colours. The finest and most imposing view is a little before the wooded part of the stream is passed; the magnitude and solemn grandeur of the mountain summits are in full view. A stroll up the glen from this point afforded me great pleasure; the solemn grandeur of the dark frowning mountains, in contrast with the heath and green patches of grass and the light colour of the time-washed stones in the rocky bed of the Burn, was a scene not easily to be forgotten. I had been on the island a fortnight when my former *compagnon de voyage* through Brittany joined me, he having been detained in London on important business, and was unable to leave England with me. My friend having brought his fifteen by twelve camera, enabled us both to secure several fine large photos. Having gone over the principal interesting parts with my friend, and also secured several sketches and photos on the coast, we decided to leave the island and go to Dalmally, in the Highlands, about eighty miles north. Leaving the island, and crossing by steamer to Glasgow, we took train to Tindrum by way of Stirling, through a wild mountainous district, passing Loch Earn and other smaller ones, some most beautiful. Arriving at Tindrum station, we had our luggage removed to the hotel near the station; the railway terminates here, but it is in course of construction to Dalmally. We ordered refreshments, and inquired if we could have a machine, and were answered in the affirmative; but during our dinner-tea the waiter informed us that they could not let us have the conveyance till next morning, so we were obliged to remain for the night.

We left Tindrum at eight on the following morning, the road winding through a wild mountain glen, with a few scattered cottages by the roadside. The stillness of the Highland wilderness was at intervals broken by small gangs of navvies making the single line of railway from Tindrum to Dalmally. We passed an iron barrack on the roadside for the men working on the line. Looking in, the arrangements were similar to 'tween decks on board a ship—hammocks for sleeping in a dining-room in the middle of the building. The railway will, in course of time, alter the aspect of this wild region. Winding at the crest of the mountain pass above Dalmally, one of the

most enchanting views I ever beheld was before us. Glenorchy is a sight that must be seen to be fully appreciated—a lovely valley, surrounded with dark, frowning mountains on all sides, and the river Archy flowing through the valley into Loch Aire, from thence to the sea. The valley is well wooded with stately trees overhanging the roads, and forming innumerable pictures at every turn, and shelter from the sun. The weather being very hot, we drove to the Dalmally Hotel, a plain building. The host, Mr. Fraser, is very attentive to visitors, doing all in his power to make them comfortable during their stay at the hotel. Having refreshed the inner man, we at once commenced operations on some very rustic cottages on an eminence near the hotel, the cottars eyeing us very suspiciously. Returning with my camera to the hotel, my friend amused himself with fishing. I called on my friend, who had arrived in advance of our party several days, and found him sketching some very picturesque cottages, several of which I afterwards made camera pictures of. These cottages are of the most primitive character. The people, as a rule, seem comfortable and well to do, and very kind and obliging to strangers. My next day was spent among the cottages entirely, several of them make very pleasing pictures. The fall of the Orchy, we were told, was a very interesting place, so we arranged a trip above seven miles from the hotel through the glen. The fall is a tumbling stream through a large mass of broken rocks, portions of which have lately been blasted to enable the salmon to get up the river more easily. There is excellent fishing at this place. Leaving my friends at the falls, I pushed up the side of the river till I came to the open falls, one of nature's grandest subjects. A large still pool, reflecting the masses of rock and scrub in the water, with a low fall on one side, and a second tumbling stream on the other, all in picturesque confusion. My friends, coming up, were much struck with the beauty of the place. We decided to return there the next morning, and commence operations at once, but, the following morning proving wet, we hesitated for a time, but at last decided to start. On arriving it cleared, and we had a most successful day. Several of these pictures were among the best I took, and we returned exceedingly well pleased with our day's work. Our next day's operations were at Loch Aire and Chilhurn Castle. This castle is built on a rock surrounded by sand banks, formed by the river and lake, with scrub and weeds in profusion. It appears to have been built for defence, and dates from about 1443. It is a large pile of picturesque ruins, the interior overgrown with scrub and weeds; the castle standing a monument of solemn grandeur of bygone ages, and no doubt many bold warriors have there licked the dust. There are several large mounds planted with trees, which we may infer are tumulus, where numbers of brave spirits, whose bones are here at rest. The loch is an inland lake about twenty-five miles long, and varying in width from half a mile. The castle, lake, and surroundings are most beautiful, and afford numbers of charming subjects for the camera and pencil. We secured several, of the castle and lake; also a second day's work in the neighbourhood. To do justice to this locality would require a large volume. Having only one day more at my disposal, I made a sketch of the valley in water colour, with the castle and lake in the distance, in company with my artist friend. On the following morning I exposed my last plate on a charming bit at the bridge near the hotel, my friend making a sketch at the time. I had now filled my plates and paper, so at 11 a.m., Friday morning, we left this most charming place. If I had had time and materials, I could have taken hundreds of fine pictures, and all various. The lovers of the beautiful in nature will be well rewarded by a trip to Dalmally. Taking leave of our kind friends, we returned by Tindrum to Glasgow, and then by the night train I arrived in Bolton about 8 a.m. on Saturday morning. I have since developed all my plates successfully, having about seventy good

photographic negatives and several water colour sketches. I hope to give my exhibition as early as possible, when the lovers of the fine arts in Bolton may judge for themselves of the pictures I have taken.

A SIMPLE METHOD OF PHOTO-MECHANICAL PRINTING.

BY ROGER LAURENT.*

When speaking of the method of printing upon lithographic stones, I omitted to say that one may dispense with transfer ink and transfer paper, and thus prevent risking any damage from squeezing the lines.

You may print direct upon lithographic stone, by applying the inked gelatine block at once to the stone.

The ink is applied carefully, lithographic or dilute transfer ink being employed, essence of lavender being mixed with the transfer ink to thin it. The block is applied to the stone under water, the two surfaces being pressed together without the formation of air-bubbles. You dry spontaneously in a current of air, and not in the sunshine.

In this case it is atmospheric pressure which acts. When the whole is absolutely dry, the back of the block is moistened with a sponge, and you wait half an hour or an hour until the gelatine has become swollen, and then it can be removed from the stone.

As the process I have described may be of great use to the wood engraver, I will give a mixture that moulds exceedingly well, and which may be employed to secure an impression for electrotyping. It is as follows:—

Yellow wax	...	...	500 grammes
Stearine	...	...	500 "
Pure resin	...	...	1 kilogramme
Talc, finely powdered...	...	...	2 kilogrammes

The wax and the stearine are in the first place melted together; the resin is then melted, and the powdered talc gradually incorporated. This composition may be remelted and employed for an indefinite period for obtaining impressions of bas reliefs in copper, &c. It is melted over a mild fire, without ebullition, being stirred well with an iron spoon or spatula, and is poured, moderately warm, upon the well cleaned and prepared matrix. If the mixture is poured upon a wood block, the same should be rubbed with glycerine, with the greatest care first of all. It is useless, of course, to try to mould from a relief in which the hollows are under-cut.

The composition is allowed to cool in a fresh locality for a period of eight or ten hours, and the mould is then carefully separated. The impression is freed from any oil



or glycerine attached to it, and is then rubbed with plumbago. The suspension of the impression in the electrotype bath is very easy. Little suspenders of copper of this form are heated in a candle flame, and then pressed obliquely into the composition, in which they stick very tenaciously when cold. This composition is better than gutta-percha, which floats upon the bath. Besides, to take perfect impressions, gutta-percha of the best quality is necessary, and amateurs can rarely obtain it.

THE SKYLIGHT.

BY H. M. SEDGWICK.†

THE construction of the skylight should have the photographer's careful study. We are very apt to leave the form of our light too much to the nature of the building we occupy, instead of making the size, shape, and position for proper effects a study. The glass roof is our source of light. If it is "away off," we lose its effects to a greater or less degree, as the light travels through so much space before it reaches that we wish illuminated, and we have shadows with little or no half-tones. I admit there are

* Continued from page 376.

† Read before the Western Ohio Photographic Association.

fine negatives made under high-lights. I have made fine negatives under such, but circumstances were most favourable. There is no form of light but under which, at certain times, good results can be produced. We should, however, aim to have our light so constructed that it will not be necessary to wait for these "favourable circumstances." Have it so arranged that you can produce just the result wished for at all times. To secure this we must have our light down where we can manage it, that we may see just what we are doing. I have worked under one of these high-lights when I was sure all the light and shadow on my subject was just right; exposed my plate, and a light cloud, so light as hardly to be noticed in the room, changed the effect entirely. Here is my plan for a light. You will observe that you have not got an acre of glass to keep in repair, and the angle is such that it can be kept "water-tight." Begin your side-light about one foot from the floor, make it ten feet wide and seven feet high, the upper edge slanting in about ten inches. Your upper, or skylight, have ten by twelve feet, the lower edge resting upon the upper edge of side-light in as light sash as possible, and secure proper strength. Let the highest point of your skylight be twelve feet from the floor. Have the light facing the north, and furnish with two sets of curtains, one of white muslin, the other blue opaque. With such a light we should secure good results. Why? Because our source of light is close to the subject and easily managed. It faces the north, and the light from that direction is more even, hence easy to manage. The white curtains will soften the light, and the blue give you shadows. The time of exposure is lessened, and everything right at all times to properly and effectually light your sitter.

RESTORING OLD EMULSIONS.

MR. S. SINGER, of Milwaukee, finds that by converting the excess of nitrate of silver in an emulsion by a liberal addition of cyanide of potassium, he can restore old, foggy emulsions. Having recently read Mr. Newton's paper on emulsions, he sends to *Anthony's Bulletin* details of some experiments. He says:—

I took some old emulsion made by various processes whose usefulness was already destroyed, added one ounce of freshly-prepared emulsion, converted the excess of nitrate of silver, after some hours, in an excess of chloride, and the whole worked clear and brilliant, and very sensitive, as by any process tried. I find that an emulsion prepared that way, with an excess of chloride, needs no extra washing, a simple immersion in the preservative being enough. The preservative is not spoiled by this repeated immersion, but remains clear, and is, if changed at all, improved. This suggested to me the idea of substituting and alcoholic preservative instead of one of water, and I succeeded beyond any expectation. The one I have tried is only a modification of Mr. Newton's, and works well.

Alcohol	6 ounces
Tannin	80 grains
Laudanum	2 drachms
Tincture nux vomica ...	1 drachm.

This solution throws down a precipitate, and after filtration through filter paper will remain clear. With this alcoholic solution the whole labour of manufacturing dry plates is reduced to a minimum. "Coat the plate with emulsion." After it has set, which it does in a few seconds, flow over the alcoholic preservative the same way as you do collodion; let the solution act a few seconds on the film, and pour back the surplus into the bottle. The plate is then ready for exposure; or you can let it dry, which it will do now in a few minutes to a bright, clean surface. In my experiments I have not noticed any tendency to blurring in these plates, but should that be the case, the alcoholic preservative can be easily tinted by an aniline colour to any depth, or to an alcoholic solution of

alkanet root, which assists in organifying the film, and is again redissolved by the alkaline developer.

A second modification I propose is in developing. By first flowing the film with a strong alkaline solution, the whole negative can be finished with from one to three drops of an alcoholic sixty-grain solution of pyrogallie acid. Prepare, for instance, the following developer:—

No. 1.

Stronger aqua-ammonia ...	2 drachms
Water	6 ounces
Bromide ammonium	6 grains.

No. 2.

Alcohol	1 ounce
Pyrogallie acid	60 grains.

After exposure, wet the film; then flow over enough of No. 1 to cover the film with one sweep; let it act a few seconds on the film. Now drop into the developing cup one drop of pyro.; pour back the ammonia solution, and reapply, when all detail will appear, and one or two drops of pyro., by correct exposure, will finish the negative. Instead of the above developer, Col. Stuart Wortley's can be used, to wit:—

Carbonate ammonia	80 grains
Water	1 ounce
Brom. potassium	6 grains;

or a combination of both, half and half. If you are not satisfied with the contrast, but want brilliant pictures, as in case of engravings, add half a grain more of bromide to each ounce developer.

Correspondence.

ON THE FADING OF SILVER PRINTS.

DEAR SIR,—Will you please allow me space for a few words as regards the fading of silver prints? I obtained this plan from a very old photographer, who had prints kept for ten years that did not show the slightest degree of fading. It is this: a large box made of japanned tin, six feet long by 4 feet high, with one false bottom about six inches from the bottom, and another six inches from the top, also false bottoms at every six inches, making in all twelve false bottoms. These have little partitions, namely, Cabinet, O.D.V., &c., as wanted, so that none of the prints can get covered up, and thus not securing sufficient washing. As a great number can be put in this machine the prints can be done in about two hours. (The box, I forgot to say, is put in a running stream or under a tap; I use the tap). Of course it can be made on a smaller scale, and not so large as mine; but I have given my size as a sort of guide, which, I hope, may be useful to the readers of the *Photographic News*. Asking pardon for taking up so much space,—I remain, yours truly,

C. R. VERNON.

Grafton Underwood, Kettering.

METHYLAL IN THE DEVELOPER.

DEAR SIR,—In the last issue of the *Photographic News*, Mr. E. T. Rolls gives an account of his unsuccessful experiments with the methylal developer, and invites me to point out where, in this process, an error is most likely to happen. Simultaneously, G. Watmough Webster, in a contemporary journal, describes his unsuccessful experiments. These unfavourable opinions on the substance that gave me such satisfaction a few weeks ago induced me to repeat again my experiments, in order to test the correctness of my first observation. The result I obtained was just as favourable as previously to the new developer. The process I adopted differs, in some details, with that of your correspondents, and that may be the cause of the different results. Supposing that the comparison of the details may be of some utility to the experimenters with the methylal, I give here some observations from my laboratory notes.

All derivatives of alcohol are extremely complicated, and the slightest change of conditions in the manufacture may introduce new substances. But let us not, for this reason,

reject the name of *methylal*, that Messrs. R. Kane and Malaguti first gave to the product of distillation under the low temperature of the methylal alcohol, in the presence of peroxide of manganese and diluted sulphuric acid (objection of Mr. Watmough Webster).

I had not made analysis of the methylal prepared by myself, to ascertain whether it is pure product, or mixed with a dozen or two of different substances, so easily formed in similar conditions, but its characteristics being very nearly the same given by Messrs. Pelouze and Fremy, permits me to take it for methylal. I shall not add *puriss*, but at all events I am very glad that the new substance will not increase the number of bottles on the shelves of my laboratory, labelled X, Y, Z, or ?

To prepare methylal I got some rectified wood naphtha from the stiller; it was of light golden tint; tested for sp. gravity, it gave 0.850, the temperature of the room being 78° Fahrenheit.

In the glass retort, of the capacity of more than one gallon, I introduced first some broken glass (to prevent excessive bumping observed in my first experiments); then, on the suggestion of the Editor of the *British Journal*, I diminished the quantity of peroxide of manganese.

Wood naphtha	20 ounces
Peroxide of manganese ..	15 "
were mixed and introduced into the retort.	
Water	20 "
Sulphuric acid sp. gr. 1.800 ...	30 "

mixed in a separate glass flask, after cooling, were mixed with the first content; and the retort was inserted in the water bath, connected in the usual way with the condenser.

A thermometer was introduced into the retort for the observation of the temperature.

At 180° Fah. first bubble made its appearance; at 190° all the mass was in froth, occupying nearly three-quarters of the retort. Supply of the gas under the water bath was so regulated that a temperature of 190° was constantly kept.

After two hours 7 ounces of the methylal collected. This had specific gravity 0.856, gave an acid reaction, and boiled at 143°.

Night interrupted operations. Next morning distillation resumed, and after six hours distillate amounted together to only 12½ ounces, of the specific gravity 0.900. It was perfectly colourless, very mobile, and of strong odour. Tested with nitrate of baryta, did not show the slightest trace of the sulphuric acid. To secure that result, the temperature of distillation was purposely kept below the water boiling point. Next it was ignited, and a very pale blue flame satisfied me of the absence of the methylic ether with its burning with a bright flame.

But formation of the ether could scarcely be expected, remembering that ether producing temperature is between 260° and 310°. At this stage I consider the methylal ready for photographic use. I do not rectify it over the carbonate of lime.

I use Mawson's bromo-iodized collodion. My nitrate bath was prepared some ten or twelve months ago, but not much used, my experiments of late being directed more on the emulsion side.

The developer prepared on this occasion was—

Sulphate of iron and ammonia ...	½ ounce
Water	10 ounces
Methylal	½ ounce

Acetic iron developer of the corresponding strength was prepared, and tried on one half of the same plate cut in two, exposure being equal, but so conducted that when it was too short for the acetic iron power, to be correct for methylal developer. That satisfied me again of the possibility of shortening the exposure when methylal is substituted for acetic acid.

Notwithstanding the very unfavourable opinion of Mr. C. Watmough Webster on the new developer, he never-

theless admits the shortening of the exposure by one-half. He says:—

"Plate 1, exposed 30 seconds, developed with C (acetic iron).
" 2 " 15 " " " A (methylal).

Results: plate 2 developed almost as quickly as plate 1, and, at first glance, seemed almost as well exposed; but a slight examination showed that the negative was very thin in comparison with the other, and so, to the casual observer, an impression of equal exposure would be conveyed."

Such is also Mr. E. T. Rolla's opinion when he says:—

"The results were disappointing; although, with wonderfully short exposure, the image flashed out instantly the developer was applied, it remained, after intensifying, very thin and weak."

Mr. Watmough Webster evidently confounds sensitiveness with intensity. I certainly, in comparing his No. 1 with No. 2, should look for the amount of details to form my opinion of the shortening of the exposure. The failure of those two gentlemen is in the difficulty of obtaining necessary intensity. This was not the case with me. My negatives are not only perfectly clear, but so intense after first application of the developer that redevelopment was not resorted to. Mr. G. W. W. also complains of the general fog. In my experiments I found that the methylal had such a powerful restraining action that with the same proportion of methylal in the water any quantity of the iron salt could be used, and that is very important, remembering that the stronger the developer is, the shorter may be the exposure.

I must observe here that I prolong the development generally more than is possible with the acetic iron. Some shining silver patches make their appearance on the surface of the liquid, but no metallic deposit is formed on the collodion film, while the solarised parts are gradually gaining in intensity.

I enclose last taken negative for the inspection of the Editor.

L. WARNERKE.

P.S. I have been told that Mr. Alexander, who first advised the use of methylal in the developer, has inserted his reclamation in the *Moniteur de la Photographie*, explaining his reasons of offence against me for publishing my experiments. Having no occasion to read the *Moniteur*, I cannot guess in what really I can displease Mr. Alexander; but if he will communicate to me his grievance, I shall be most willing to rectify my fault, if there really was any committed.

[The negative forwarded by Herr Warnerke is in every way excellent; at once delicate, detailed, and brilliant.—Ed.]

PROPOSED TESTIMONIAL TO MR. CROUGHTON.

DEAR SIR,—My attention has been called to the concluding portion of Mr. Brittlebank's letter, wherein he proposes a testimonial to me for publishing from time to time my experience and methods of working. Will you allow me, through your pages, to thank him and many others who have written me letters of sympathy; and, while I confess to being flattered at such a proposal, I must decline the honour, as against the principle which has actuated me in my contributions. To the societies and the photographic press I have given (and I hope I always shall) my experience freely, and without wishing for any return. Our art has attained the high position it holds by the free and generous publication of formulae, processes, &c., which has been the characteristic of all its best and greatest men; and I think the least any one can do who profits by the freely-given discoveries of Archer, Talbot, and the host of names which have been associated with the advancement of photography, is to add his mite, however small, freely and openly to all. I hope, therefore, Mr. Brittlebank will not be offended if I decline to profit by his suggestion and contribution, and ask you kindly to return him the cheque forwarded to you, with many thanks for his kind intentions and good wishes.—Yours truly,

G. CROUGHTON.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The annual outdoor meeting of this Society took place on Saturday, August 28th, at Kingeton, but, owing to the unfavourable weather, very little work was done with the camera. The members afterwards met at the residence of Mr. Samuel Fry, Surbiton, who had again this year most kindly offered to entertain them. Having partaken of a sumptuous repast in a tent especially erected in his garden studio, the rest of the evening was spent in music and conversation, and thus another social reunion of the South London Society was brought to a close.

CHARGE OF STEALING PHOTOGRAPHIC GOODS.—An operator was charged at Sunderland with stealing a quantity of portraits, printing-frames, transparencies, &c., from his employer. The goods being given up, the charge was withdrawn, and the case dismissed.

PAPER FOR PHOTOGRAPHY.—In the list of prizes offered for inventions and improvements by the French Society for the Encouragement of Industry, is one for the production of an improved paper for photographic purposes.

OXY-CARBON LIGHT.—Edgerton's new oxy-carbon light was recently exhibited at a meeting of the Franklin Institute, and described in the Journal of the Institute:—"It consists of a small copper vessel suspended immediately over the flame of a jet arranged on the ordinary oxy-hydrogen plan, and connected with a reservoir for keeping up a supply of the oil. The heat of the flame converts the hydrocarbon into a vapour of high tension, which is conveyed to a chamber at the base of the jet of about half a cubic inch in capacity, where it mingles with oxygen and is burned in the usual way, the flame impinging against a cylinder of lime. It is necessary, in order to start the lamp, to heat the copper vessel containing the oil with a spirit lamp, and as soon as vapour is produced the oxygen is turned on and the lamp withdrawn."

HARDENED GLASS.—Mr. H. J. Powell, of the Whitefriars Glass Works, describing in the *English Mechanic* some experiments carried out at the works with De la Bastie's method of hardening glass, thus sums up the results:—"Hardened glass is not 'unbreakable,' it is only harder than ordinary glass, and though it undoubtedly stands rough usage better, it has the disadvantage of being utterly disintegrated as soon as it receives the slightest fracture; and, up to the present, until broken, of being undistinguishable from ordinary glass, unless a certain pink tone noticeable in hardened flint glass can be taken as an indication. This glass is known as 'toughened' glass, and we have seen the terms 'malleable' and 'annealed' applied to it. Nothing can be more misleading than these unfortunate epithets. The glass is hard, and not tough or malleable, and is the very opposite to annealed glass. Annealed glass is that the molecules of which have been allowed to settle themselves: the molecules of hardened glass have been tortured into their position, and until the glass is broken are subject to an extreme tension. It is the sudden change of temperature that 'hardens' glass heated up together with the oil may be annealed, but decidedly is not hardened. A piece of hardened glass is only a modified Rupert's drop—i.e., it is case-hardened: the fracture of both is identical, both resist the diamond, and both can be annealed. Moreover, in the middle of imperfectly hardened glass a line is plainly visible, which seems to mark the extent of the case-hardening. This line resolves itself, under the microscope, into a mass of bubbles and stria; it seems to be the nucleus of breakage, and, consequently, as soon as the cutting wheel approaches it, utter destruction ensues."

PREPAYMENT FOR PORTRAITS, AND NON-SUPPLY OF PRINTS.—The *Daily Telegraph* states that at Great Marlow, George French, John French, and Chas. French, described as residing at 4, Durham Place, Dalston, photographic artists, were brought up in custody before the county magistrates on Saturday, charged with having on divers days in the month of August at Great Marlow, and at other places, unlawfully and by false pretences obtained several sums of money from certain persons, contrary to the statute. The prisoners, who were travelling photographic artists, visited Great Marlow about three weeks ago, took photographs of several persons there, and, after receiving the money, promised to send the cartes in a few days. The photographs, however, never arrived, and information was given to the police, who succeeded in apprehending the

prisoners on the 28th of August. Evidence was given showing that the negatives taken by the prisoner were worthless. They were committed for trial at the Bucks Quarter Sessions. It transpired during the hearing of the case that the prisoners are wanted for similar offences committed in Herts, Beds, Bucks, Derbyshire, and other parts of England.

To Correspondents.

B. R. G.—The pictures must be delivered at the gallery before the 23rd instant. You will obtain all particulars by writing to Mr. Friewell, the honorary secretary.

M. F.—Old collodion is very efficient for cleaning plates; but it is very unpleasant to use, because of the fumes, which are often very painful to the eye. On the whole, we should prefer to throw the old collodion away.

ENQUIRE.—The salting preparation in the shellac process stands as follows:—Water, 12 ounces; bleached shellac, 6 drachms; phosphate of soda, 2 drachms; borax, 1½ drachms. Dissolve the phosphate and borax in warm water, then add the lac in a state of powder, and place the whole over the fire, stirring until the lac is dissolved. Finally, after cooling, add 30 grains of chloride of ammonium. Filter, and if the solution be intended for keeping, add a piece of camphor. The paper is immersed, dried, and floated on a 60-grain silver solution for five minutes. A fine artistic tone is produced by fixing in hypo alone; but for a black tones a gold toning solution may be used. Common lac may be used, but would give a yellow tint to the lights.

D. WINSTANLEY agrees with us on the impropriety of ventilating personal grievances in journals, but thinks that when imputations affecting the commercial credit of individuals have been made, they (the persons implicated) have a claim to be heard. This may be doubtless true; but it should be in the pages in which such damaging statements have been made. To open our columns to communications referring to allegations made elsewhere, would be simply to transfer to our columns, without reason, a discussion having no public interest. For the rest, we may simply state that Mr. Winstanley gives a categorical contradiction to the statements of Mr. Brothers referred to in our last.

G. A. M.—We have published many formulas for the preparation of sensitive paper which will keep. You will find summaries of the experiments of the year in each of our last three or four *YEAR-BOOKS*. We do not know of any one who will sell a formula for producing such paper.

G. S., an experienced carbon printer, writes to say that reading with interest all that transpires in connection with carbon, he is struck with the fact that in everything published scant justice is done to Mr. Swan. He points out that, notwithstanding the alleged defects in Swan's process, which subsequent patentees—Johnson, Lambert, and Sawyer—are supposed to have improved, some of the finest work of large-size is still done by Swan's process. "For many years past," he says, "large prints have been commercially produced by Mr. Swan's process, that is, using paper coated with india-rubber as the provisional support—carbon prints, too, equal to silver prints. Nearly two years since I assisted at a discussion, at a large wholesale photographic dealer's, on the subject of certain large Swiss views, panoramic and full-sheet, published by Braun of Dornach. They were pronounced by all present, master and man, to be silver prints, until I proved them to be carbon." Our correspondent then examines some of the new claims in terms which might lead to unprofitable discussion, and concludes by saying:—"I have no wish to disparage the efforts of any of these gentlemen. Messrs. Sawyer and Co. have brought the Autotype Co. into working order. Mr. Johnson is a clever chemist and observer. They, as well as others, have laboured for the development of carbon printing. Messrs. Lambert will do much towards spreading and popularising it; and all will, I trust, receive at least their full share of honour and emoluments; but they have been bitten by the patent tarantula. Need I say more?"

DR. A. A. MANTELL.—The details of the wet preservative process in question are, briefly, as follows:—Take of old English honey, four ounces; Price's glycerine, two ounces; of a thirty-grain nitrate bath, six ounces; mix, and then add half an ounce of kaolin, and shake occasionally for an hour. Place the mixture in daylight for two days, then filter for use. Coat an ordinary encoiled plate; pour off first coating, and apply a second. Drain well, and place in slide. It will keep several hours in hot weather, and a day in cool weather. Expose a little longer than a wet plate, and develop as usual. Several modifications of this plan have been proposed; but, so far as we know, no improvements have been effected.

D. R. G.—The spots are due to the particles of bronze in which the back of the card is printed coming into contact with the print, as we have often explained. The bronze consists of sulphide of tin, and produces a sulphur spot on the silver print. Several Correspondents in our next.

The Photographic News, September 17, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

A TOUR IN THE ENGLISH LAKE DISTRICT—BITS OF OLD LONDON.

A Tour in the English Lake District.—It sometimes happens that one desires a quiet holiday, free from the exertion and excitement which travelling daily from place to place involves. Frequently you are in the mood for a rattle through a strange country, for a trip to Switzerland, or to the Black Forest, for instance; or a run far north into Scotland across the moorlands by Braemar, or beside the Caledonian Canal; or the charms of foreign city life may allure you, and Paris, Vienna, or Berlin entice you over the water; while again there are such places as Baden-Baden, Ems, Schwalbach, Wiesbaden, and other spas too numerous to mention, which appear especially inviting to those in want of a change. Sometimes, however, we repeat, one seems to long for a very quiet tour—a holiday of holidays, as it were—and if you will only keep away from places of seaside resort, such a holiday is best spent without leaving the country. We don't know how it is, but lately it seems as if everybody goes for his autumn holiday to the sea-side, and the consequence is that one hears everywhere of exorbitant charges and scarcity of lodgings. Holiday seekers for the most part, we suppose, are gregarious, and where one goes the other must follow. Take the case of Switzerland, for instance; there are certain routes which have been sketched out, certain valleys that have become popular, and certain villages that have a reputation. All who go to Switzerland go to these places, and find at this season of the year crowds of visitors and exorbitant prices. And yet if people would be content with travelling less in company there would be no need of complaint. As an instance of this, we may mention that last week we saw a bill of a party just returned from Switzerland, who had been travelling, therefore, in the very height of the season. These ladies and gentlemen had stopped a week in a retired valley many thousand feet high, at the east end of the Lake of Geneva, under shadow of the snowy Dent Du Midi and the lofty Diablerets. They had been living *en pension*, as it is termed, and the charge per diem for each person was three francs fifty cents for board, and one franc for bedroom and service. They did not dine in a magnificent *salle-a-manger*, it is true, off a dozen dishes, but the table, although somewhat *bourgeois* in character, was none the less enjoyable. Fancy living a week in Switzerland, at the end of August, within sight almost of the Lake of Geneva, for twenty-five shillings a week! Such a thing would appear incredible to most people; yet this was the amount which each and every other of the guests in the hotel—amounting to between thirty and forty, hailing from Lyons, Geneva and Lausanne—paid for their board and lodging. This is, then, a good instance of what may still be obtained by tourists who take the trouble to look out for themselves, and rely upon their own individual exertions in choosing their playground. In the lake district, where we have spent a few weeks very pleasantly, located in one central spot from which the laziest may enjoy a variety of excursions, we have had an opportunity of observing how many holiday seekers come through the district for change of scene and air, and it was with much surprise that we found their numbers so limited. Scarcely a dozen foot travellers have we met, while the inns and lodgings—the latter especially—were far from full. At Windermere there were rows of lodging houses standing empty, and an agent informed us that he had sixteen houses to let at the village of Ambleside. It is true that it is a long journey to Westmoreland from London, but in these days of excursion tickets, travelling is not so expensive as it used to be. The district abounds in good

second-class inns, and to those used to the high prices charged in Scotland and elsewhere the charges appear exceptionally moderate. And as to the weather, when it does not actually rain, the varied changes you are subject to are positively pleasing. One does not require fair settled weather, as in the case where mountains are higher, to enjoy the scenery, for, truth to tell, big fleecy clouds, resting on hill tops here, add to their beauty. For the three weeks that we were in the district there was not a cloudless day; but, nevertheless, the weather could scarcely have been more favourable. The mist and bloom in the valleys gave a distance effect, which is required to give extent to the scene, and in practising a little dry-plate photography, with which we amused ourselves from time to time, the cloud effects have been of especial value. The lakes, too, lie so embosomed in the hills, that their surface is, often as not, like a mirror, the reeds and stones at their margin showing clearly in the foreground of a picture. Woodland paths we have secured time after time, with not a breath of air to stir the pretty ferns and undergrowth; and as the still lakes are nearly all of them fringed with foliage, this absence of wind is at times exceedingly welcome. A clever landscape photographer would have made some rare pictures, had he enjoyed the opportunities we have had, for every one knows the charming effects that are to be secured when there is alternately sunshine and shadow, such as we have been enjoying nearly every day. Sometimes the wind would spring up in gusts of regular intervals, and in this case it is necessary, of course, to cap the lens two or three times during exposure, watching carefully for the still moments, so that the sensitive plate shall only be acted upon during these favourable periods. This is easily done when one has dry plates to deal with, for we have not hesitated to keep a plate in the slide for half-an-hour on a hot day, without the least compunction. It will be a good thing, however, when we get M. Warnerke's improved method in working order, and thus successfully get over the difficulty of changing plates and storing them up from the light, which are the chief solicitudes of the dry plate work now-a-days. When we have paper films, instead of glass, to deal with, it will do away with much of our anxieties, for not until the glass plates are back again in one's own dark room, and the developer is applied, does one know how far they have been properly preserved. We think that a good stock of adhesive paper for sealing packets, and a plentiful supply of tin-foil (not the thin kind, but that known as caddy tin, which bends and does not break), form the best means of packing, after the yellow and black papers have been used; for not only is the caddy tin impervious to light and moisture, but it renders the packet far less breakable and liable to accident in transit.

Bits of Old London.—Have any photographers occupied themselves especially with "Old London?" A very taking series of prints, we think, might be obtained of bits of old London by any one who will take the trouble to look up such remnants of the city as are still left to us. Every day these relics become more and more rare, for modern improvements are the inveterate enemies of picturesqueness in London streets. Some time ago we called attention to the writings of Walter Thornbury and Thomas Archer, two genial authors who have made old London their personal study, and whose works, therefore, might be taken as a sort of guide for any photographer who wishes to make up a portfolio of old-fashioned sketches of this character. We firmly believe that if such a series were now published, either printed in silver, or, better, by a permanent process, like the portraits of actors and other people brought out now-a-days, that there would be a good demand for such pictures; or the photographs might be taken to serve as illustrations to the writings of the popular authors we have mentioned. The subjects would have to be treated with care, so as to prevent the antique effect being marred by objects of modern

life. Some of the scenes—as, for instance, bits of Holborn, which here and there still exist—would have to be vignettised, probably, in order to keep out new shops or houses on either side; but in Wych Street, in the Borough, and at the East End, by the Thames, there are still models to be found which might be photographed bodily. There are old river-side taverns in the locality of Wapping which would afford most picturesque studies, especially if they could be taken from a causeway or landing in the river; and the old coaching inns on the Surrey side of the water, several of which are still in existence, with their roomy yards and quaint balustrades, would be equally interesting. Accompanied by suitable letterpress, such pictures would find a ready welcome with the reading public.

GERMAN CORRESPONDENCE.

BY DR. VOGEL.*

PHOTOGRAPHY IN BERLIN—PHILADELPHIA EXPOSITION— DIFFERENCE BETWEEN DRY AND WET PLATES—OBJECTIONS AGAINST THE OBSERVATIONS ABOUT THE ACTION OF COLOURED SUBSTANCES ON THE SENSIBILITY ON THE SILVER SALTS.

[AFTER some remarks on the late Vienna Exposition, and on portraiture in Berlin, Dr. Vogel proceeds:—]

It appears that the reproducers of oil paintings have no fear on account of the size of plate any more. The Photographic Society of this place has boldly taken a series of pictures in the Dresden Gallery, in the original size up to thirty-six inches; soon plates of four feet will be issued. Photography will be mammoth, and mammoth must be the business if the enormous expense of the plates should be made to pay. Photography of oil paintings is, in fact, a great industry; she has conquered the world, notwithstanding the hue and cry of art critics, who howled that the copper-plate engraver would be without bread through it, a laughable prediction, for a good copper plate will constantly find a purchaser, while a poor one, of course, must draw in its sails aside of a photograph.

There is here an art dealer, of some importance, who has published long articles in the newspapers of the pernicious influence of photography on art, and who, several years ago, solemnly stated that he had no photographs in his store on principle, only genuine works of art, such as copper-plate engravings, steel engravings, lithographs, &c. The man continued his opposition for ten years, but it availed him as much as the opposition of the stage-drivers to the railroad thirty years ago. To-day I visited the establishment, and, to my surprise, I found there not only the latest photographs of oil paintings, but on his roof a new atelier, which had been rented by a photographer.

On my journey I have made, as I wrote to you previously, many exposures with dry plates. I partly made use of simple washed bromo-silver collodion films, which were prepared in the bath, and partly Stuart Wortley plates. The bromo-silver plates, which were, bear in mind, without a covering preservative, worked exceedingly well the first eight days; after that spots appeared; they are, however, not durable. The Wortley plates kept very well, and, in regard to sensitiveness, are very nearly equal to wet plates.

I received plates which, on the first glance, were fully equal to wet plates. If, however, I tried the dry and wet plates together on one object, I found the dry plates more sensitive to light parts and less sensitive for dark parts than the wet plates. In landscapes, therefore, the dry plates showed a very dense sky and background, but a perceptibly weaker foreground than the wet plates. If I exposed the Wortley plates until the foreground was equal to the wet plates, the distance (background) in the dry plates appeared considerably over-exposed, while a wet plate produced a more harmonious picture, and the tones in the fore and

background were in proper relation. I am convinced that with a suitable change in sensitive mixture, by adding iodide or bromide, this fault can be obviated. For the present the wet process is for all cases where it depends on true artistic effect far ahead of the dry process. I see in the journals which were issued during my absence, various gentlemen have taken great pains to doubt my discovery that the sensitiveness of the silver salts for the so-called non-actinic rays, by the addition of an absorbing substance, is perceptibly increased. Such doubts only excite my humour. I have on my journey again exposed about one hundred coloured bromide plates before a number of witnesses, and developed many of the plates in the presence of witnesses. I have photographed the spectral lines in the yellow and orange again and again, and if others have tried it without any result, the fault is certainly not mine, but with the gentlemen themselves. Without overrating myself, I believe I have sufficiently proven that I do not suffer from hallucination any more than Captain Waterhouse, Professor Tschimi, Professor Pedler, Mr. Meldola, Professor Schuster, in whose presence I exposed and developed my plates, as well as Professor Becquerel, of Paris, who has tried my experiments repeatedly, with the greatest success. Facts which I have tried daily with the greatest certainty, and which I have shown numerous men of science by trial, cannot be removed by such phraseology. Whoever does not want to believe me can leave it alone. I am not at all anxious to teach persons who are versed who do not want to be taught, and who stubbornly persist in their prejudices.

Mr. Carey Lea has opened an article against my theory, in the *British Journal* of 21st of May, in which I only deplore the remarkable superficiality he betrays in optical matters. Such sentences as Mr. Lea publishes—i.e., corallin transmits strong red light, and consequently the sum of its absorption spectrum must be green, a sentence which, in reference to naphthalin-red with which he has not made a single trial repeats, and is, for those who are acquainted with the absorption spectra, nothing else than sheer nonsense. No man can draw out of the colour a body possesses an inference in regard to its absorbing capacity in the spectrum. Erbium salts and didymium are quite colourless, but show a powerful absorption-line in the spectrum. Chloride of uranium (UOI) is green, and yet it not only shows an absorption line in the red, but two very powerful ones in the green, right and left of the line. Fuchsin is red; accordingly, if Lea is right, "the sum of its absorption spectrum" lies in the green. If, however, a reduced solution of fuchsin is observed in the spectrum it will be found that the main absorption-line is in the yellow and if you take an ethereal or collodion solution, the absorption-line will move over into the orange, beyond the line D. These are all matters which can be read in any good handbook on optics, and the knowledge of which I thought could be pre-supposed by Mr. Lea. Just as superficially Mr. Lea speaks of my publications. He says I experimented with only three colouring matters. This is not true. I experimented with corallin, fuchsin, naphthalin-red, picrat-green,* and two kinds of aldehyde-green, and later yet, with chlorophyll. With the latter Becquerel also experimented, and produced the same result as I did. He further asserts that "one of the three substances cited by Dr. Vogel, that which he has principally worked, and on which he principally has relied, is corallin." This, also, is not correct. With corallin I made my first attempts, but found very soon that this substance changes very easily; that a trace of acid is capable of moving its absorption capacity totally, and that different kinds of corallin offered possess different qualities, therefore I laid this substance aside already after the first attempt, and the substance with which I have principally worked is not corallin, but the more durable naphthalin-red. Mr. Lea confesses that he has not tried this substance, but follows that I do not know the absorption spectrum of it, and that he has not made a personal inspection of it with-

* Condensed from the *Philadelphia Phot*

—man Chemical Soc

standing, boldly asserts that the sum of its absorption-spectrum must be green, this assertion is worth as much as the tales of the kingdom in the moon. and I need scarcely call attention to it, and in the by me observed facts on the effect of certain colouring matter, it depends on the position of the actual absorption-line, and not on empty theories about "the sum of absorption-spectrum." If, finally, Mr. Lea, in reference to the sensitive effect of colourless substances which I have been bespeaking, claims his priority, I would refer to my publication of 1873, p. 1302, of the Reports of the German Chemical Society, where mention is made that wet bromide of silver—i.e., bromide of silver in the clear nitrate of silver solution—possesses a different sensitiveness to colour from dry bromide of silver, and that Mr. Lea had not yet worked with morphia, I mentioned expressly.

Mr. Lea has, therefore, no cause to be jealous of his right to priority, especially as he does not respect the priority of others very much. So he publishes in the *British Journal* of May 28th, 1875, as the result of his latest experiments AgBr and AgI are sensitive to all visible rays of the spectrum, and fully ignores that I published the same already in April, 1874, in the Reports of the German Chemical Society, p. 550, in my article, which Mr. Lea no doubt elsewhere himself cites; likewise I have, in June 1874, at the same place, stated that certain rays of a special exciting or a special continuing power do not exist, and if Mr. Lea lately published the same, an acknowledgment of priority might well have accompanied it.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XVII.

THE PRINTING OR "POSITIVE" BATH.

As the success of the photographic picture is judged from the resulting prints, a great responsibility rests with the operator in this branch of the work, and it should be his aim to get the very finest results. To do this he must studiously observe the effect of every change of condition in paper, bath, fuming, toning, fixing, &c., and acquire the power of producing any required effect. To do this with intelligence and certainty he becomes a first-rate printer; failing this, though he may occasionally produce good work, being the result of accident, it is of little worth. To attain perfection the printer must have a thorough knowledge of the printing qualities of the negatives entrusted to him, and have complete control over his chemicals. His first study is the effect produced by the different brands of commercial albumenized paper, and the particular kind of work for which they are most suitable. I shall not enlarge on this subject, as it is a matter for individual experiment, and one which is continually being modified and altered as new brands are introduced.

THE PRINTING BATH.

The bath used for sensitizing the paper to be used in printing is, however, a branch of photography which has received so much attention and study, that certain safe rules have been formed. Of the strength of the bath—one of the first considerations—there is, as with our negative bath, a difference of opinion, some authorities maintaining that a strong solution produces the best prints, and others giving preference to a weak solution. As in the case of the negative bath, so in this case, I cast in my lot with those in favour of the comparatively weak bath, or perhaps, more strictly speaking, one of medium strength; the mistake being, I think, in the two extremes. It might be supposed that the weak bath would require an extended floating of the paper on its surface, and the strong a short floating, but this is not so; and further, it might be expected that the paper floated on a weak bath takes up less silver than from a strong bath; this also is an error, for

the salt in the albumen will take up the amount of silver it requires, whether the bath is strong or weak; chloride of silver being formed.

From the fact that the effect of the strong solution is to coagulate the albumenized surface of the paper, and it is some time before the albumen commences to absorb the silver, whereas on the weak solution the albumen, not being coagulated, more readily takes up the silver, we learn that a strong bath requires a long time of floating, and that a weak bath takes but a short time; the bath of medium strength being between these two extremes in the time required for floating the paper.

This, then, would tend to prove that the gain in time would establish the weak bath as superior to the others; but there are awkward consequences in floating the paper for a short time on a weak bath, as in the long floating on the strong bath. The paper floated on a strong bath certainly prints brilliantly and with bold effect, but the bronzing of the shadows is a great defect, and the weak bath has the effect of producing weak prints, or, if the time of floating be lengthened, the print has a sunk-in appearance.

The objections, then, seem to indicate that there is a happy medium, and this appears to be in the bath from 40 to 50 grains to the ounce of water, for ordinary work in portraiture.

For the positive bath nitrate of silver and pure water are required. Dissolve the silver thoroughly in the water, and test with the hydrometer for strength. I have found alum a good thing for the printing bath, its effect being to harden the albumen, and thus keep the silver more on the surface. The best way of adding the alum is to place a small lump in the neck of the funnel through which the bath is filtered, and it thus takes up the required amount.

The loss in strength of the bath after sensitizing paper should be made up from a stock bottle of sixty-grain solution, so that the bath may be kept as nearly as possible of an uniform strength.

Citric acid is added to the bath where it is wished to preserve the paper beyond the ordinary time for general use, to preserve it against discolouration.

Nitrate of ammonia is also sometimes added to the printing bath—nitrate of ammonia 35 grains, and nitrate of silver 40 grains to the ounce of water, slightly alkaline with liquor ammonia. This bath should be placed in the sun until all impurities are thrown down, and then filtered before use.

RECTIFICATION OF THE PRINTING BATH.

The causes of disorder in the printing bath are from albumen dissolved from the surface of the paper, and organic matter and dust which gain access to it, and from imperfect filtration, causing the bath to discolour. When only showing a slight colour, or evidencing but trifling irregularities, a few drops of a solution of permanganate of potash, ten grains to one ounce of water, may again and again prove sufficient to restore it. Add the permanganate solution until a slight rose colour appears, place the bath in the sun in a clear white bottle, when it will further discolour and eventually grow clear as crystal, the impurities depositing at the bottom of the bottle. Filter clear. It is advisable to keep the bath exposed to the purifying influence of light when it is not in use.

Kaolin is also a good purifier. Place a little in the bottle holding the bath solution, and stir with a glass rod for a short time. When the kaolin is settled, decant the solution (or pour off without disturbing the deposit of kaolin), and filter. The kaolin may thus be used again and again.

Boiling the Bath.—The printing bath will require more energetic treatment, in time, than those advocated above; and, though it is not a bad plan to boil at stated intervals, whereby certainty is ensured, yet it is not absolutely necessary to remove the impurities we know must exist in the

bath, until their deleterious effects manifest themselves. The bath is first made *slightly alkaline* (if not so) with ammonia, and then placed in an evaporating dish on a small gas stove, and submitted to heat until it has evaporated about one-half or two-thirds of its bulk. By this time the impurities which have made it black and thick during the boiling should have settled. Now turn off the gas and allow the solution to cool, add pure water to reduce it to the proper strength, and add the nitrate used in the original making up of the bath, and test its alkalinity; filter perfectly clear, and the bath is ready for use.

TO FUSE THE BATH.

Place the bath solution in the evaporating dish over the gas stove, and boil down to dryness, as advised with the negative bath (see Chapter IV.), using the same precautions against the formation of the explosive fulminate of silver. It may be necessary for this to add acid. Stir the mass at the bottom of the evaporating dish, and, when cool, add pure water and filter. The organic matter, which has been carbonized by the heat, will filter out, leaving the solution quite pure and clear. Now make up your bath according to the formula of the original.

GENERAL HINTS ON THE CARE OF THE BATH.

Care will do away with the necessity of constant doctoring of the bath in a great measure. Guard against the admission of dirt and foreign chemical substances. Keep a separate graduate and hydrometer for testing the strength of the solution, and see that they are always scrupulously clean before using them—much trouble and uncertainty may in this way be spared. The sensitizing dish, when the solution is poured back into the bottle, is stood on one corner, to allow it to drain; it may then be rinsed with clean water, the rinsing being preserved, and the dish put away in a clean cupboard resting on pure blotting paper. The bottle holding the solution is then placed in the sun, the top of the bottle being covered, to screen it from dust.

THE PRACTICAL PRINTER IN AMERICA. XXXVIII.

MAKING THE PORCELAIN COLLODION.

I WILL below give a formula for the making of the collodio-chloride which I know to be good, having used it for more than two years, and I can truly say that I never knew a batch of this collodion to fail any one who has ever used it, providing it was properly mixed in the making of it.

If the porcelain collodion is not carefully mixed and made, it is the most fickle of all collodions.

The purest of chemicals and great care are required, both in the mixing together of the different solutions, and in always keeping the collodion when it is made in absolute darkness, else it will be worthless, for if it is exposed to the light it will become discoloured, and a chemical action is commenced which will in a short time render it as worthless as so much dirty water.

For this reason photographers, to guard against the actinic light getting at the contents of the bottle, should not only keep it in a dark place, but wrap printed and untuned paper around it, so that every part of the bottle will be covered, and only a little of the neck will show; and no more of that than what is required for the purpose of pouring the contents out, so as not to have the collodion to touch the paper. The writer generally uses a couple of thicknesses of yellow envelope paper.

Another thing for the beginner to bear in mind is that he should always mix the different solutions, in the making of the collodio-chloride, a drop or two at a time, and no more, for then the solutions will be more likely to get mixed together than if you were to pour them in quicker. As a rule, always bear in mind that the slower the solutions are mixed together the longer time will the collodion keep in a good condition.

Then, again, always handle the bottle of collodion as gently as possible, so as not to shake the contents any more than is really necessary.

Mix the solutions in the order given below, and never otherwise.

When ready to make the collodion, first proceed to make up four solutions, which will be stock, and which will at some future time enable you to make up more collodion in a short time, as you will only have to take a certain quantity of each of the stock solutions and mix them together.

A.—Plain Collodion.

Alcohol, 95°	...	...	7 ounces
Ether	...	...	9 ounces
Gun-cotton...	...	...	112 grains

B.—Silver Solution.

Nitrate of silver	...	...	480 grains
Distilled water	...	...	1 ounce

C.—Calcium Solution.

Chloride of calcium	...	...	128 grains
Alcohol, 95°	...	...	4 ounces

D.—Citric Acid Solution.

Citric acid	...	...	128 grains
Alcohol, 95°	...	...	4 ounces

Label each of these bottles, and state plainly what the contents of each bottle consists of, and exactly how it was made; in fact, write the whole formula on each label.

Obtain a ten-ounce collodion bottle which is thoroughly clean, and rinse it out with a little ether. Carefully decant 8 ounces of A, after it has been standing for a few days, into this bottle, and next add 64 drops of B, adding but two or three drops at a time, shaking well between each addition to prevent the silver from precipitating.

Now add in the same way 4 drachms of C, adding two drops at a time. This last addition is the most important of all, for the moment a drop of this is added, it will commence to turn milky, and chloride of silver is formed. This last addition should be done in the dark, and it would be well for the beginner to heed it, for from this time until the collodion is used up, the bottle should always be kept in the dark.

Finally, there should be 4 drachms of D added in the same manner as the calcium.

The beginner must bear in mind that chloride of silver is far more sensitive to the light than nitrate of silver, besides giving a softer, finer, and more delicate print than the latter.

It is on this account that the paper which is used in the positive process is salted generally with chloride of ammonium, although chloride of barium is sometimes used, so that we have a paper prepared which, when floated upon a bath of nitrate of silver, the chloride in the paper will take up from the bath the silver which it needs, and form chloride of silver, which will print, as before said, much better than nitrate. Now the same thing is the case in the making of the collodio-chloride, with the exception that we cannot prepare the porcelain plate with a chloride, as in the case of the paper, neither can we float or swab the plate successfully. To overcome this, we make a collodio-chloride which will in its composition combine all of the nature of the albumen or the plain salted paper and the nitrate bath. The chloride of calcium, in conjunction with the nitrate of silver in the collodion, will form a chloride of silver, which is just what we wish. The plain collodion in the above collodio(n)-chloride is to give a tough body (when viewed in one direction) to the solution, which body is increased or diminished according to the number of grains of cotton there may be to the ounce of collodion, and to prevent it from getting thicker than it is already; then keep this plain collodion, as well as the collodio-chloride bottle, tightly corked.

The nitrate of silver in the above solution answers the place of the positive nitrate of silver bath, and the chloride

of calcium, which is the chloride I always use, takes the place of the chloride of ammonium in the paper, and the chloride of silver (which is formed by the nitrate of silver and the chloride of calcium uniting) in the collodion is the same as the chloride of silver which is formed in the paper when floated upon the nitrate bath.

To get a richer tone to the freshly silvered paper, as well as to coagulate the albumen and prevent the solution from penetrating too far into the paper, alum, nitrate of ammonium (especially the former), are generally used; and to get a richer tone in the collodio-chloride, citric acid is used in the quantity recommended above.

In place of using the chloride of calcium, many photographers use the chloride of lithium or strontium, but I have always liked the calcium best, although I cannot say that I have given either of the above (i.e., lithium or strontium) a very fair trial. The chloride of calcium, however, is the most used of the above named chlorides.

When the collodion is well made, it will have a most delicate pearly whiteness to it, which is the most beautiful colour of that kind that I ever saw.

It can be worked with good results in a day after it is made, but it is in fine working order in about a week. I have used it when it has been four months old, and with the exception, in hot weather, of a very slight tinge of yellowness, it has been all right.

If porcelain collodion is made to keep for a long time, the greatest pains should be given in adding the silver and calcium to the collodion, so as to have it properly mixed. It should be made more sensitive in winter than in summer, and for the beautiful imitation, the "photo-porcelain," it would be better if the proportion of chloride of silver were six grains instead of eight, as the shadows in the making of this style of picture are more given to bronzing than in the real porcelain; but for the porcelain itself eight grains is the best.

PHOTO-MECHANICAL PRINTING.

BY E. BIERSTADT.*

ANOTHER modification of the Albortype is known as the Heliotype, patented in England and in the United States by Ernest Edwards. This process adopts the same materials used by Mr. Albert, the only difference being that the chrome gelatine is made thick enough to sustain itself after being detached from the plate on which it is made, and is transferred to a metal plate to be printed from. The advantage claimed by this patentee is that there is no fear of breaking the plate while printing. This fragility of glass plates in the Albortype has been so greatly magnified, that it might be well to notice for a moment the treatment to which the glass plates are subjected in comparison with the method adopted by the Heliotype. The latter uses only a vertical pressure, whilst the Albortype uses all kinds of pressure known in printing. The glass plate is bedded in plaster of Paris on a stone, and becomes as solid as the stone itself, and in practice each press will not break on an average more than two or three plates in a year by constant printing, although both the lithographic scraper and the copper-plate or roller presses are used as well as the vertical, and either of them is more trying to both plate and film than the typographical pressure.

In relation to the respective merits of the Albortype and the Heliotype processes, it may be well to compare the two methods more fully.

1. The same materials are used in both, viz., gelatine and bichromate of potash; and, according to the specifications, both are hardened on the back by exposure to light, and both are further hardened by the use of a coagulating material, generally chrome alum. There can be no difference here.

2. The thickness of the layer of gelatine in the Albortype is, when dry, about a two-hundredth part of an inch. In the Heliotype it is more than five times as thick; five times

as much material must of course be used, but, as the cost is only a fraction of a cent to a square foot, this is a small item; still it is slightly in favour of the Albortype. Another advantage is, that in moistening the film it does not swell as much; and as the roller must touch all parts in order to deposit the ink, it is plain that the less relief there is, the better will a roller come in contact with the deepest parts.

3rd. Concerning the treatment of the respective films: the Albortype is retained upon its original base, while the Heliotype is detached from it, so as to be transferred to another.

The advantage claimed by the former is the entire freedom from contraction and expansion, so that maps and designs can be made exactly to a scale; this is impossible with a detached film.

The latter claims a more perfect surface than the Albortype, because the picture is made upon that side of the film which was in contact with the glass, and was protected from dust. In four years' practice I have never seen a plate that was damaged by dust; I must, therefore, decline to allow this claim.

4th. The ink, and the methods of applying it. It is evident that thick or stiff ink contains more colouring matter than thin, and in the Heliotype specification it is recommended to reduce the thickness of the ink with tallow or olive oil, and not with lithographic varnish, because the adhesive properties of a stiff ink and a leather roller are too trying to the detached film; the oily ink is therefore applied only with composition rollers.

With the Albortype, adhesive or unadhesive ink may be applied with any kind of rollers. When it is desired to print a picture full of half-tone, and as brilliant as an ordinary photograph, the stiffest ink is applied with a leather roller; the result is that two or more different grades or thicknesses of ink can be applied one over the other, without the fear of dissolving the stiff ink by repeatedly passing a roller over it charged with thin or oily ink. The Albortype method is acknowledged to have produced the most brilliant pictures in half-tone, such as portraits, landscapes, and views, taken directly from objects. In line engravings there is very little difference between the two processes; that there should be a difference of any kind is accounted for only in the toughness of the films, and in the permanency with which they are attached to their supports.

With a well hardened film of good gelatine, firmly attached to its base or support, pictures can be made with all the brilliancy of albumen photographs, and, being printed in permanent inks, they must endure as long as the surface on which they are printed. Each one can judge for himself which of the processes comes nearest to perfection. Improvements will undoubtedly be made; even now steam presses are being used to print the Albortype.

With the facilities we now have, and which are fast developing themselves in collographic printing, there seems to be nothing in the way of making photography the most perfect medium through which to secure illustrations for books, or for any purpose for which pictures are required. The printing-ink gives us permanency, and the unerring eye of the camera will record what it sees with a fidelity unapproached by art, and in a universal language.

The time is not far distant when every city or town of any importance will have its photo-mechanical printing establishment, and photographers will avail themselves of its facilities for doing all their printing; this it can do now cheaper than is possible by the silver or chemical method. This is not mere conjecture. The actual time required to produce a dozen pictures after the negative is made is no more than is necessary for the same number of silver prints, and the cost of material is much less.

Much more might be said on this subject, but seeing is better than hearing, and as the Albortype process is in practical operation in our midst, all may see it who will, and judge of its merits for themselves.

* Continued from page 436.

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MR. VANDERWEYDE'S NEW FORM OF STUDIO.

THE efficient lighting of the model is probably the most important part of the duty of a portraitist: true likeness, pictorial effect, and rapidity of exposure—so important in securing natural expression—like depending upon such efficient lighting. All other aids and appliances are comparatively worthless without it: the most perfect lenses, chemicals in the finest condition, the highest artistic skill in posing, are thrown away unless the facility for securing judicious light and shade exists. Various forms of studio and modes of lighting have been proposed and tried, with varied degrees of success; from a structure built entirely of glass, with blinds and curtains to every part of it, to the dark tunnel with small portion of top and side light at one end. But until now, no definite attempt has been made to reduce the mode of lighting to a science, and to construct the studio on scientific principles.

As our readers are aware, Mr. Vanderweyde, an American artist, whose recent avocations have afforded him facilities for seeing many hundreds of photographic studios in America, England, and continental Europe, has devised a new mode of lighting the studio. Struck with what to him seemed a defect common to all the studios he visited, he sought to remedy this defect. In all the studios he met with he found more or less of useless or mischievous light—that is, light not reaching the sitter or helping to produce the picture; whilst in many instances this light, by causing injurious reflections, destroyed relief in the picture. Mr. Vanderweyde felt the desirability of devising a studio which should permit of the concentration on the sitter, or the objects forming the picture, of every ray of light entering the studio, and of acquiring such control over the light as would permit the artist to produce any effect, proportion, and relation of light and shade in the photograph which he might conceive to be desirable for pictorial purposes. The general principles underlying the theory which Mr. Vanderweyde arrived at, from observation and reflection, coincide in a curiously precise manner with those which we laid down when describing the theory of lighting about a dozen years ago; and as the statement of conditions we then made accurately expresses the fundamental idea upon which Mr. Vanderweyde's theory is based, we will quote our former article to aid the reader in understanding what Mr. Vanderweyde has effected.

"We commence by reiterating two or three propositions which will not be disputed.

"First—All light, direct or reflected, entering the studio, ought to illuminate the sitter, the background, or the accessories; in short, all the objects to be delineated in the picture, and nothing else.

"Second—That no light, direct or reflected, should enter the camera except that proceeding from the illuminated objects which are required to form the picture.

"Third—That as light always travels in straight lines, and as only those which reach the glass at right angles pass directly through, all others being more or less thrown off by reflection, it follows that the greater portion of the light entering most studios does not reach the sitter, but, passing through the glass to the portion of the room opposite to it, is thence reflected in a variety of useless directions.

"The amount of mischief effected by the presence of unnecessary direct or diffused light on the shadows is not easily estimated, especially with a surface so delicately sensitive as that obtained where bromo-iodized collodion and iron development are used, by which every radiation of every kind is at once rendered apparent. In this class of negatives, moreover, clean transparent shades are of vital consequence.

"There are other difficulties caused by this unnecessary light. The uncertainty and uncontrolled character of the minor reflections falling upon the sitter are a source of difficulty which is, perhaps, little noticed, but, nevertheless, injurious. Another serious disadvantage, especially in large towns, is that produced by having to work through an illuminated atmosphere. If smoke, or mist, or dust, be present in the atmosphere to any appreciable extent, these reflect light; and if a large body of unnecessary light pass through the room, this smoke, or dust, or moisture in the room will reflect a large amount of light, and render it almost impossible to obtain clean shadows or brilliant, well-defined pictures, especially when lenses of long focus are used in order to do justice to standing card portraits."

The method by which Mr. Vanderweyde aims to secure the concentration of all light on the sitter, and the exclusion from the studio of all light not employed in producing the picture, is very ingenious. Instead of an ordinary flat window, he gives the window a zigzag form, so that the light reaches the sitter through a series of panes or strips of glass, of (say) from twelve to eighteen inches broad, each set at a different angle, so that the rays, striking it at right angles, pass straight through to the sitter. This series of panes, standing at angles varying with their distances from the sitter, so that they may all actually face him, are connected with another series placed at angles varying similarly, so as to face the sitter when placed at the other end of the room. The sitter, at whichever end of the room he may be placed, sees simply the panes of glass which face him, and the light which they admit; the corresponding series, facing the end not in use, are covered with blue opaque blinds, excluding all the light which would otherwise pass in and reach the camera and other objects without illuminating the sitter. The result is a greater concentration of light on the sitter, with actually less light entering the studio. One of the primary results of this arrangement is a sense of coolness and of moderate light, which is comfortable and refreshing, and very unlike the blinding glare of light too often seen in an ordinary photographic studio. The next result which should theoretically follow is greater rapidity from the greater concentration of light, and absolute utilization of all light permitted to enter. On this point it will only be possible to speak after a careful series of comparative trials, yet to be made. In the one studio of this kind already erected, we have had opportunity, through the courtesy of Messrs. Fradelle and Marshall, who have been the first to try this novel system of lighting, of seeing many of the results, as well as some of the experiments. The quality of the results is without a question exceedingly admirable, the effect of light and shade is unusually fine, and there is an amount of relief and modelling, combined with perfect rendering of texture, such as we very rarely see. Altogether the quality of the results is produced in the first experiment is in every way superior.

Benjamin Wyles, for studies of sunset, and E. P. Lee and Co., for some exquisite coloured photo-enamels, each receive first bronze medals. The Judges also named A. and J. Bool, Reuben Mitchell, and W. J. A. Grant, but these exhibitors having had awards in the two past exhibitions, are by a rule of the Society barred from taking prizes in the succeeding year.

A more detailed notice will probably appear in our next. We append the Official Report of the Judges.

REPORT OF THE JUDGES IN THE PHOTOGRAPHIC DEPARTMENT OF THE ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION, NOW OPEN AT FALMOUTH. BY THOMAS HART.

(Read before the Society, Tuesday, Sept. 14th, 1875.)

GENTLEMEN,—It is with feelings of great pleasure that the Judges in this department report on the magnificent collection of photographs now exhibited, and to many of which they have had the honour of awarding medals; and regret that they could not, by the rules of the Society, extend the prizes. They would recommend the Committee to revise the prize list for competitors before next year, in order more fully to meet the requirements of the rapid development of the art, as it is fast becoming not merely a chemical science, but a real fine art, requiring the highest artistic culture, as evidenced in such works as those exhibited by Col. Stuart Wortley, Geo. Nisbett, Messrs. Chaffin and Sons, Robinson and Cherrill, Messrs. A. and J. Bool, La Fosse, David Hedges, W. Nicholson, W. Brooks, Robert Crawshaw, Garrett Cocking, and many others whose works are in the Exhibition.

The First Silver Medal is awarded to Messrs. Chaffin and Sons, of Yeovil, for their group No. 749, taken direct; showing many high artistic qualities, and is the largest direct photograph (of figures) from one negative ever exhibited here. Messrs. Chaffin exhibit other works showing the same careful manipulation and good results.

The Second Silver Medal is awarded to George Nisbett, of Bournemouth, for his portrait of a young lady, No. 687. Mr. Nisbett exhibits ten photo. pictures, all showing that he possesses talents of a high order, and that he has used them well. His picture No. 682, "She will Recover," reminds one of the late Oscar G. Rejlander's exquisite art productions.

A Special First Silver Medal is also awarded to Col. Stuart Wortley, for his collection of large studies of figures, which are very beautiful. They are powerful in light and shade, well graduated, and remind us of the works of Rubens, Rembrandt, and other old masters. He exhibits, also, a splendid collection of large instantaneous views ("What are the wild waves saying?" is particularly successful); also the largest and best specimen of dry-plate photography we have ever seen.

A Special First Silver Medal is awarded to David Hedges, of Lytham, for his fine studies of animals (a most difficult branch of the art) most successfully treated, particularly the horses in case No. 691.

The First Class Silver Medal is awarded to W. Nicholson, of Ventnor, for his "Bonchurch," taken direct. It is a view well selected, broad in treatment, and shows that Mr. Nicholson has an eye for the beautiful.

The Second Class Silver Medal is awarded to Messrs. Robinson and Cherrill for their "Gleaner," No. 728, showing all the characteristics of their work (for which they are so justly famous), but scarcely equal to former productions exhibited here by them—"Bringing home the May," for instance, of which we have lively and pleasant recollection.

The First Bronze Medal is awarded to W. Brooks, of London, for his fine enlargement of trees, No. 784 (evidencing that Mr. Brooks has an intense love of his art, and that he is an artist capable of producing eminently beautiful work). The distances are atmospheric, and well rendered.

A First Bronze Medal is awarded to George F. Dew, of Leamington, for his collection of beautiful landscapes, which are all well selected and cleverly manipulated. "Kenilworth" (No. 768) is very fine.

A Special First Bronze Medal is awarded to E. P. Lee and Co., of Cardiff, for their case of coloured ceramic photograms, which are gems of art.

A First Bronze Medal is awarded to J. M. Young, of Llandudno, for his well lighted and beautifully modelled portrait studies.

A First Bronze Medal (special) is awarded to B. Wyles, of Southport, for his instantaneous studies entitled "Cloudland," which are exceedingly artistic productions.

Others exhibiting, and whose works deserve especial notice, are those of La Fosse, who sends some very fine portraits (see No. 702); Garrett Cocking, who is a thorough artist in feeling, and a very clever manipulator (see No. 787, "Caller Herra," and No. 789, "The Knight of the Bath," &c.) We hope to see more of Mr. Cocking's works.

Messrs. A. and J. Bool, of London, send some very fine landscapes—their "Hampshire Lane," No. 679, and No. 676, "A Wayside Bridge," particularly. The last-named has a sheeny effect, well rendered. Both are taken direct from nature. Mr. R. Mitchell, of Bolton, sends four excellent landscapes.

The Amateur Department is also well represented: first, by the splendid collection (of about thirty works, including landscape and portraits) by Robert Crawshaw, Esq., to whom is awarded a First Silver Medal for his large study of "Daisy," No. 829; No. 801, portrait of the Right Hon. Marquis of Bute, is also very fine, as are several others: secondly, by W. J. A. Grant, who sends some splendid bits from Russian Lapland (see frame No. 831, many of which were taken at midnight).

BACKGROUNDS AND THEIR USES.

BY L. W. SEAVEY.*

IN studying the effect produced by the background of a painting, engraving, or photograph, a good and general practice is to cover light or dark portions, prominent lines, or accessories, either with one's hand or a piece of neutral-tint paper, and noting carefully the result. One portion may be too light, another too dark; a perpendicular line, too decided or too near the subject, may intersect the outlines of the figure or an accessory at such point, that it seems to grow from it; acute angles be formed which lead the eye away from the principal object, and give a kind of cut-out effect.

Occasionally, flowers, vases, or other accessories used in photography, from their surfaces being reflective, appear too light, and consequently too prominent. Faults of this kind are easily detected by covering those parts with the thumb or finger, and observing the change produced by their absence.

There was a picture at the Buffalo Convention which was much admired for the impression of refinement and purity which it conveyed. The contrasts were not strong, there were no large masses of shadow. The subject was that of a lady, head and bust—the background slightly graduated, so that the figure was fairly, but not strongly, relieved. The hair was not very dark in its shadows, and the dress might have been a grey. The shape of the picture was circular, and about three inches in diameter. A few moments of study, examining the principles on which the picture was constructed, revealed a little patch of shadow, about the size of a pea, darker than any other part of the picture, at the left and lower part of the background. A test of the value of this morsel of shadow by the plan suggested discovered that what was before a well-balanced picture, delicate without being weak, became flat and uninteresting. The foregoing illustrates the fact that many times a weak picture, photograph, or painting lacks only a little touch of good deep shadow. In fact, we have, within the last week, applied the above principle. Having painted a photographic background representing the sea-shore, we observed that it lacked strength. A few vigorous touches of shadow in the foreground, without increasing the lights, not only supplied it, but put the whole into better aerial perspective.

One of the best effects we have seen in a three-quarter figure was where the back of the subject, in black or brown, was turned to the light, the face almost a profile, arms folded, the background behind the head and in front of the figure nearly plain; at the side from which fell the light, a shadow (painted) was cast at an angle of forty-five degrees, filling the entire lower corner of the card, somewhat darker toward the bottom, and intersecting the out-

line of the subject at, or slightly below, the shoulder-blade. This shadow supported the figure; against it the subject seemed to lean.

The above arrangement of shadow should be used only in side views, as in a front figure it throws the picture out of balance. As there are many galleries supplied with interior backgrounds which have a shadow falling as described, we would respectfully suggest a trial of this style of side-view.

The most appropriate background for the head of a child seems to be a vignette, probably because the softly-blending shadows of the face and their rounded forms would lose somewhat their interest by the introduction of other objects, and the fact of its being impossible to introduce more than a small portion of any accessory. Cloud effects, when represented, should be very delicate—barely suggestive, and not, as we have seen them, too stormy. They should be avoided when the focus of the lens will not reach the background, as the dull, heavy atmosphere which seems to surround the figure is not in accord with the spirit of childhood. A comparison of two imperial cards of a child, where a landscape background with rustic accessories have been used, the one plain, the other vignette, will be found to differ principally in the following points: in the plain picture the background, however well painted, will lack force; then there may be too large an expanse of flat tint around the head, and the heaviness already spoken of will be present; another cause of which is the customary short exposure, and the consequent lack of detail.

In the vignette print the effect will be more aerial and delicate, and the interest will be centred solely in the figure, bearing scrutiny, and pleasing the imagination by the suggestive surroundings.

METEOROLOGICAL REPORT OF THE CHEMICAL INTENSITY OF DAYLIGHT, TAKEN AT BLACK-POOL, LANCASHIRE.

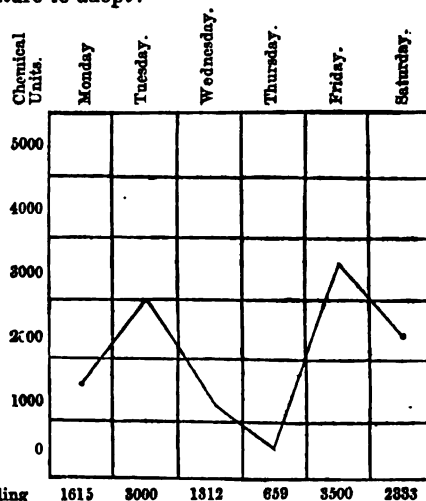
BY D. WINSTANLEY, F.R.A.S.

So far as I am aware, no meteorological reports of the aggregate chemical intensity of daylight have thus far appeared, though manifestly this is of much more importance than a series of isolated observations of the chemical intensity of light prevailing at certain particular moments of the day. For instance, in estimating the amount of rainfall it is more desirable to know how many inches or what fraction of an inch fell in twenty-four hours, than how many inches or what fraction of an inch *would* have fallen had the rain continued during the entire day at the same rate as that prevailing during some particular hour or some particular moment of the day. The truth is, even a large number of isolated observations of the chemical intensity of daylight furnish but an indifferent means of arriving at the aggregate intensity of the total light of day.

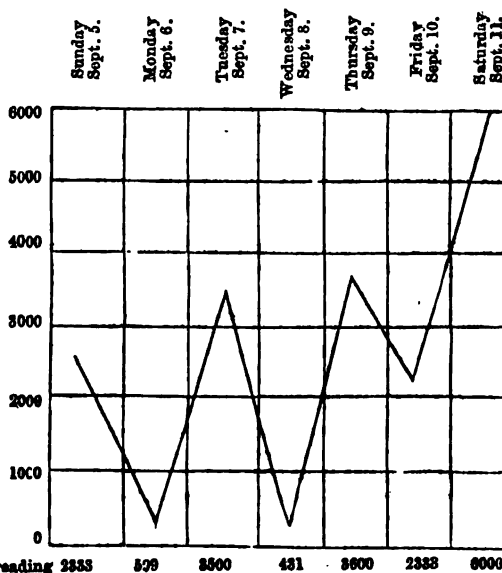
I have now in daily use an instrument which I have devised for taking a record of the aggregate chemical intensity of the total light of day, and by the employment of which, therefore, a really reliable estimate of the total amount of chemical force available for work may be arrived at. Unfortunately I have not at present the advantage of a station commanding an uninterrupted view of the entire celestial hemisphere, and my reports must therefore for the present be confined to an observation of the southern sky. The plane of my instrument is vertical, and its aspect to the meridian. The sensitive material is silver chloride, and the daylight estimated confined to such portions of the spectrum as affect the haloid named. The figures used, though reliable amongst themselves, refer to a purely arbitrary standard, not yet correlated with the standards now in use. The following are the figures for the week ending September 4, 1875:—

Date.	Day.	Aggregate of Chemical Power.
Aug. 30	... Monday	... 1615 units
" 31	... Tuesday	... 3000 "
Sept. 1	... Wednesday	... 1812 "
" 2	... Thursday	... 659 "
" 3	... Friday	... 3500 "
" 4	... Saturday	... 2333 "

The following gives the results in the graphical form I intend in future to adopt:—



The following gives the results for the week ending September 11th:—



I may remark that I do not intend any long continuance of these reports, but I have reason to believe that another and a distinguished member of our craft will shortly take the matter up, giving more detailed reports, and in a more attractive form than mine.

ROZSNYAY'S EXPERIMENTS IN HYALO- PHOTOGRAPHY.*

To prepare hyalo-photographs, or pictures upon glass, M. Rozsnyay uses finely polished soda glass plates, which withstand the operations of the process far better

* Deutsche Industrie Blätter.

than potash glass plates. The plate is coated in the ordinary way with bromo-iodised collodion, and the picture is developed with a solution of iron, and intensified with chloride of gold solution of 1-2000 strength. In this way the film of silver is converted into one of gold—a change that is necessary in order to protect the plate where covered by the image when it is afterwards submitted to fuming with fluoric acid. Silver only impartially protects the plate, and then the impression is not so sharp and clear.

As the fluoric acid cannot get to the glass through the film of collodion, this must be first of all decomposed and removed, in such a manner, however, that the picture does not suffer in any way. This is the most difficult part of the operation, and only succeeds with care and experience. The glass plate is very apt to break by submission to unequal heat, and yet it is necessary to heat it to redness, so that the collodion may be completely removed, and the gold-silver image may be, to a certain extent, fused into the glass. At a high temperature like this, a potash glass plate melts a little, and becomes uneven; and for this reason it is that soda glass must be employed.

The plate is allowed to cool slowly, and is sufficiently cleaned, after which it is submitted to the action of fluoric acid vapour; if this be generated in a uniform manner the etching will act very evenly. After etching, the plate is freed from the film of gold by means of aqua regia, and the image is then ready for further treatment. If it is rubbed over with powdered graphite, which is well removed afterwards, we have a dia-positive, in which all the finer detail can be seen, and after this process the image may be electrotyped. This electrotype should serve as a printing block for mechanical printing.

M. Rozsnyay, who is an amateur, has not prosecuted his experiments beyond the etching, for the reason that he had no proper muffle-furnace, and could not, therefore, produce his images on glass properly. The furnace he employed was a rough one, and the heat so badly regulated that his plates always broke during this process; but such an accident, he argues, should not happen in a properly constructed apparatus. His fractured plates he was enabled to etch very perfectly by means of fluoric acid vapour in the way mentioned, and although it was not worth his while to carry the matter further with broken plates, he believes perfect success might be obtained by following the path he has pointed out. If suitable glass plates were obtained, and proper apparatus, he thinks that printing blocks might be secured in this way without much difficulty.

THE PRINTING DEPARTMENT.

BY ALFRED HALL.*

Of all the departments in photography, that of printing requires the most care, the most skill, and the best judgment; and by far the most constant application—all of which is essential to access.

The printer must be at his post early and late, he must be constantly on the alert, ever watchful that no enemy creeps in to disturb his solution, to see that the albumen paper is in condition to absorb the silver properly, after which it requires constant observation that the printing may be carried to just the right point; for if over or under printed, no matter how good the negative may be, the result is inferior.

A printer may produce a very poor print from a good negative, or a very good one from an inferior negative, after which it requires constant watching to see it safely through the washing, toning, and fixing.

It requires judgment and taste to decide just how a photograph should be printed to give it the best effect; the artistic appearance of a photograph depends full as much, and perhaps more, upon the printer, than it does upon the operator.

A printer should be to photography what the three great pillars "which are denominated wisdom, strength and beauty" are to the Masonic Lodge. He should have wisdom to contrive ways to print different negatives, so as to bring out the best points and hide the bad ones; strength to support him through the long hours of mental and physical labours incumbent upon the successful printer; and then he must have beauty, "not of person, necessarily," but an eye for the beautiful, that he may determine when he has produced the finest and most pleasing effects possible to produce from the negative, both in style and tone.

How few there are in charge of this important branch of photography who possess these qualifications! If the reader is one of the fortunate few, he will not be benefited by anything I can say, but to the thousands of inexperienced persons who are employed to carry on this important branch of our beautiful art I will speak. It is to this class I dedicate this article. It is useless to give definite rules for managing the printing department, even could it be run by rule. In such case skill and judgment would be useless, a knowledge of the rules would be all that would be necessary. I will try to give some general ideas that will aid good taste and judgment.

In the first place, almost all nitrate of silver is in a super or acid condition, and must be made slightly alkaline with ammonia, and kept in this condition to make brilliant prints. Some contend that if the solution is acid the fuming of the paper remedies the evil, or produces the same effect as adding ammonia to the solution. This is a mistake—practice proves to the contrary. The strength of the silver solution depends upon the intensity of the negative, and the strength of the salting of the albumen paper.

The time for floating depends upon the temperature of the room and solution. It varies from thirty seconds to a minute. Thirty seconds in a warm summer day, if the albumen is not too dry, is sufficient. The paper should be kept for twenty-four hours before using in a damp place; it will absorb the silver more evenly, and will lessen the liability to blister. Albumen dissolves slightly and falls into the silver bath, decomposes there, and produces an acid reaction, which makes it necessary to test the solution often with litmus paper, that you may be sure to keep it slightly alkaline by adding a drop or two of ammonia as required.

Fume from five to ten minutes in warm weather—longer in cold.

If the print when taken from the printing frame has a cold, greyish look, shorten the fuming; it should have a dark cherry-red colour. If your prints bronze in the shadows, shorten the time of fuming; if that does not remedy it, reduce the strength of the silver solution. If the prints look weak and flat on coming from the printing frame, strengthen the silver solution, or lengthen the time of fuming, or both. A weak negative should be printed in the shade, or under ground glass or tissue paper. The slower, to a certain extent, the reduction of the chloride, the stronger will be the print. Wash the prints well in several changes of water to remove the free nitrate, then redden with very dilute sulphuric acid, wash the acid well out in several changes of water. Tone in an alkaline bath, made so by adding common washing soda.

The toning bath should be tested every time before using, to see that it is alkaline. I always keep a piece of litmus paper in my bath while toning, that I may observe its condition. Carry the toning just far enough to get rid of the unpleasant red colour when fixed. The brilliancy of prints is often destroyed by carrying the toning too far, besides it gives them an unpleasant grey look. Your experienced eye must direct you in this.

After fixing, remove the prints directly to a strong brine, let them remain from half-an-hour to an hour, wash in three or four changes of water, and tone before drying.

* *Western Photographic News.*

Correspondence.

THE FORTHCOMING EXHIBITION.

DEAR SIR,—Permit me to call the attention of your readers to the advertisement, which appeared for the third time in your issue of the 10th inst., relating to the Exhibition of the Photographic Society. The Assistant Secretary will be prepared to receive pictures, addressed to him at the Gallery, 5, Pall Mall East, from Monday the 20th, to Thursday the 23rd inst., both days inclusive.

The Exhibition will be opened with a conversation of members and their friends, on Tuesday evening, September 28th, and will remain open till the 20th November.

It is requested that all communications may be addressed to Mr. Edwin Cook, Assistant Secretary, at the Gallery. I am, sir, yours truly, R. J. FRISWELL, F.C.S., Hon. Sec. 9, Conduit Street, W., September 15th.

CARD PORTRAITS IN EXHIBITIONS.

DEAR SIR,—For a long time past I have been going to ask you to allow me, through the medium of your valuable paper, to make a suggestion, but have waited, thinking I should like to read it coming from a more able pen than mine; but as no one seems to broach the subject, I feel I cannot allow it to remain unnoticed any longer.

It seems strange to me that of all our great and wealthy admirers of our beautiful art none of them think it worth their while to endeavour to raise the standard of our C.D.V. portrait by offering prizes for the best productions. Now I think a great mistake has always been made at our exhibitions by entirely ignoring the existence of the C.D.V. by not giving a few medals or other suitable awards for this size picture. It has been, is, and (I venture to predict) will be, the photograph of the day.

No matter how perfect are our enlarging processes, or how well they can produce large work, the public will not have them, except in exceptional cases. Why, then, has this branch been so long overlooked or forgotten, and preference and encouragement given to that of the smallest demand? I am quite sure that nineteen out of every twenty photographers have never been able to show what they can do, or compete with others at exhibitions, simply because they have not the lenses to do the size work required. How many have lenses to take a 15 by 12 portrait, a 12 by 10, or even a whole plate? If they have the lens, have they the glass room suitable for these portraits? Or if they have both, how many can afford to spare the time necessary to do them properly?

You, or some of your readers, may urge that medals or prizes have been given for enlarging, and, of course, the best carte negatives would, in most cases, produce the best enlargement, so that indirectly they have been encouraged. This I admit; but then photographers who have their living to get by their profession cannot spare the time to make experiment in enlarging, though they may have excellent facilities and abilities for doing so.

Then what I would suggest is this: that a special exhibition be held for carte and cabinet size portraits, and an entrance fee of (say) five or ten shillings for each case of portraits exhibited be charged; the cases not to exceed a given size, and the entrance fees to form prizes for the successful competitors.

I would also like to see the operator's ability recognized in some form or other. To meet this, then, I would suggest that bronze medals, or even certificates, be awarded to the operators of the successful pictures, and, of course, something of more value to the employer. This, I think, would induce all to do their very best, and so improve the quality of our pictures. I do not think I am alone in wishing to see the services of the operator recognized, and I am sure there are hundreds like myself who would like to know who are the best photographers in the United Kingdom, and who would try and imitate their work, improve upon, and beat them.

Trusting you will find room for this, and that in your next

issue a few others will give their opinions on this subject, I am, dear sir, faithfully yours, N.

[There cannot be a doubt that the general tendency of the projectors and managers of exhibitions has been to encourage the production of large pictures; possibly with the view of making a more effective display; possibly because card pictures constituting the pot-boilers, the necessary staple, of each portraitist's work, it has not been thought necessary to stimulate improvement by any inducement beyond trade competition. We, nevertheless, quite agree with our correspondent, that it would be wise to encourage the highest excellence in that style which must inevitably be most largely produced. Some mode of recognizing the skill of the operator is also doubtless desirable.—Ed.]

METHYLAL IN THE DEVELOPER.

DEAR SIR,—The remarks in Mr. Warnerke's letter in your issue of the 11th inst., referring to my experiments with the methylal developer, misrepresent my published results. His statements would lead your readers to suppose I lent my name to support his view of the power of the new agent. I beg to refer any one interested to the original account in the *British Journal* for Sept. 3rd, from which I quote the following:—"It will thus be seen that, so far as my experience goes, it is dead against the new developer, which in no way surpasses what we have had in daily use for so many years."—I am, sir, yours truly,

G. WATMOUGH WEBSTER.

Talk in the Studio.

PHOTOGRAPHIC EXHIBITION.—Photographers intending to contribute to the forthcoming exhibition should remember that Thursday next, the 23rd inst., is the last day for sending in pictures.

ARE ALL RAYS OF EQUAL VELOCITY?—A premium of one thousand dollars has been placed in the Franklin Institute, U. S. A., by Mr. Uriah A. Boyden, of Boston, to be awarded as a premium to any resident in North America who shall determine, by experiment, whether all rays of light and other physical rays are, or are not, transmitted with the same velocity. Memoirs, describing the experiments, to be sent to the Institute before January next.

POISONING WITH CYANIDE.—An inquest was held a week ago at Yeovil to enquire into the cause of death of a gentleman who appeared to have been poisoned. The medical man in attendance gave his opinion that the cause of death was exhaustion proceeding from madness; but it also appeared that he had attempted to poison himself. In the course of his evidence the doctor said:—"I noticed a white fluid dribbling over his lower lip, and he immediately vomited a crystal, which was dissolved. I ran off for remedies, as I felt sure deceased had taken poison. Whilst I was at Mr. Maggs' shop, Mr. Maggs came in with another crystal, which he said deceased had vomited. I went back to the dying man, and administered an emetic consisting of fifty grains of sulphate of zinc. Deceased swallowed the zinc, but vomited immediately afterwards. I saw no more crystals, and with the exception of the mouth being burned, deceased seemed no worse for the poison. Deceased had swallowed cyanide of potassium, and after he had recovered a little I gave him a full dose of chloroform, sufficient to send him to sleep. He fell asleep in ten minutes, and slept for ten or fifteen minutes, but when he awoke he seemed in the same excited condition, only not quite sensible. I gave him half a grain of morphia in a solution, but he would not drink the whole of it. He took about two-thirds of the dose, but it did not have the least effect." More chloroform and more morphia were administered, and death took place the following day. In cross-examination the medical man stated that he administered the sulphate of zinc to clear the stomach of cyanide. He believed that very little of it had entered the stomach; but he prescribed sulphate of zinc because he had read that it was a proper remedy for cyanide. The jury found that death resulted from the deceased having, while in an unsound state of mind, taken cyanide of potassium, thereby increasing previous exhaustion, which resulted in death. It cannot be too well known and remembered that a mixture of perchloride and sulphate of iron, in proportions we have often

detailed, is the best antidote for cyanide of potassium, and that the ordinary developer of sulphate of iron may be administered with advantage until the proper mixture can be prepared and administered under the superintendence of a medical man.

SECOND-HAND APPARATUS.—Messrs. W. Lawley and Son have just issued a very copious catalogue of their extensive and varied stock of second-hand photographic lenses, cameras, and other apparatus by well-known makers, affording a capital choice from much excellent material. A very useful, concise, and trustworthy series of instructions for beginners is appended to the catalogue. A revised catalogue of telescopes, microscopes, and other philosophical instruments has just been issued by the same firm.

To Correspondents.

LEO.—Bromide of silver is not appreciably soluble in a solution of nitrate of silver; hence, with the exception of being very slightly weakened by the formation of bromide of silver, the nitrate bath will not be at all injured by the accidental dropping in of the crystals of bromide of potassium. You may filter the solution, and use it without further trouble.

J. HOLZ.—We have no practical knowledge of the lenses you name. Doubtless the manufacturer will supply the information you seek. We regret that we cannot write private replies to queries on photographic subjects.

R. A.—The chief cause of blisters in carbon prints whilst developing, in our experience, has been the use of water at too high a temperature. It is safer a little under 100° Fahr. than over that temperature. The use of tissue which has been kept just a little too long sensitive has at times in our hands tended to the production of blisters. We have not tried development on the patent flexible support, and cannot explain why it should cause blisters, when prints on another support, produced at the same time, and under the same conditions, were free from such tendency. The print you enclose is considerably over-exposed. Tissue which has been kept sensitive some time, especially in damp weather, develops more slowly than that freshly prepared, and if in any degree over-exposed, is more difficult to reduce in depth by long soaking in warm water. Some of the back numbers of the YEAR-BOOK are in print, but not all; the last five years are. The back numbers of the News from January to June 18 are in print, with the exception of May 7 and June 4.

J. S. LOCKMAN.—We cannot with certainty say where the cause of your failure exists. It may be, and is not improbable, that the plates developed with the methylal in the iron solution were over-exposed, and that the fog is due to over-exposure; or it may be that the methylal was not a pure or suitable sample. It is not a substance at all likely to be kept ready prepared by chemists or medical men, and requires considerable care in its preparation. 2. The cause of the albumen being dissolved off the surface of the paper would undoubtedly be the use of a solution containing too little silver. You must bear in mind that some samples of albumenized paper rob the nitrate bath of its silver much more rapidly than others. The more highly salted the paper, the greater the amount of silver taken up by each sheet as it is sensitized. Hence, in using a small quantity of solution in the dish, it rapidly becomes weak, and begins to dissolve the albumen. 3. The varied effects produced by looking at different coloured objects, or various brilliantly illuminated objects like a window, and then closing the eyes, and seeing a series of objects of complementary colours, or objects inverted in their order of light and shadow, are familiar to most observers of optical phenomena, and are often very interesting.

OLD PHOTO.—Mr. Cadby Ponting has been dead many years, and his business was, so far as we know, discontinued. 2. Almost any fancy stationer will be able to supply or procure for you white enamelled paper. We prefer plain paper, such as Turner's Calotype paper, or any similar sample. A good stout plain Rive paper answers well. It may be used without preliminary treatment, but we prefer a sizing with arrowroot. Baryta white is sulphate of baryta. 3. There is no work on collodio-chloride printing. We have published many articles on the subject in the News, but there is no work devoted to the subject. It is practised commercially in America much more extensively than in this country. Mr. Bruce, of Dunee, and some others, use it solely in their commercial work.

W. CAMPBELL.—Your projected studio seems in every way, both in proportions and arrangement, very excellent. We should only have suggested one modification: the panes of glass are apparently about one foot wide; they would have been better nearly twice as wide, and so have escaped the interruption to the light caused by many sash bars. The ground plan, also, seems very conveniently and judiciously arranged.

CAPTAIN PIXLEY.—The catalogues of photographic apparatus issued by Morley, of Islington Green, and Lawley and Sons, of Farringdon Street, will most likely furnish the information desired.

LIBRER.—There is clearly an inaccuracy in the statement of the formula, as the quantity of water in which the 242 grammes of sulphate of ammonium is to be dissolved is not stated. We have no means of verifying the formula, which appeared years ago, and it is probable the error occurred in the original publication.

D. WINSTANLEY AND A. BROTHERS.—We have letters from both these gentlemen. Each thinks that the other has been allowed to say too much, and himself too little. We regret the necessity to disoblige either, but we cannot discuss the question between them in these columns.

A CONSTANT READER wishes to know the nearest National School of Art to Baker Street Railway Station, and the cost of tuition there. Can any reader inform our correspondent? We should think South Kensington to be the most available.

FRANK SUTCLIFFE sends us an example of a defect with which he has been recently troubled, arising in paper which, until now, half the ream being used, has not troubled him. It consists in red spots, or circular patches about a quarter of an inch in diameter, having the appearance of being untuned in the midst of a well-toned print. There is a general gradation from the centre to the edges. We have seen similar patches where the paper has been touched with something greasy, which caused it to repel the toning solution. We have not met with any case definitely like this. Has any of our readers done so? We have not seen the backgrounds to which our correspondent refers, but have heard something of them.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR AUGUST.

BY WILLIAM HENRY WATSON.

Observations taken at Brayton, near Whitehaven, 36 feet above sea level.

Date.	THERMOMETER.			BAROMETER.			Direction of Wind at 9 a.m.	REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1	56°	63°	56°	29.91	29.97	29.80	S.W.	Fair and sunny.
2	58	61	55	29.97	29.96	29.80	S.	Fair and sunny.
3	57	61	59	29.89	29.85	29.87	S.	Fair, but gloomy.
4	60	63	61	29.89	29.88	29.89	S.W.	Rain p.m.
5	60	63	63	29.88	29.86	29.84	W.	Fair, but gloomy.
6	59	63	60	29.80	29.77	29.78	W.	A little rain a.m. and p.m.
7	59	64	61	29.79	29.80	29.80	S.	Thunder and lightning, with heavy rain, this afternoon.
8	56	60	56	29.79	29.76	29.73	N.W.	Fair, but gloomy
9	58	64	60	29.51	29.51	29.50	W.N.W.	Rain a.m. and p.m.
10	59	61	61	29.50	29.46	29.50	S.	Heavy rain p.m.
11	60	—	—	29.51	29.55	29.62	S.	Fair and sunny.
12	59	61	60	29.53	29.50	29.45	S.	Thunder and lightning, with rain from 3.45 to 5 o'clock p.m.
13	60	68	59	29.50	29.56	29.60	S.W.	Fair, generally sunny.
14	62	65	62	29.60	29.75	29.80	S.S.W.	Rain a.m.
15	62	66	62	—	29.90	29.84	S.	A little rain this afternoon.
16	63	67	62	29.76	29.70	29.70	S.W.	Fair, but gloomy.
17	62	70	66	29.67	29.63	29.67	W.S.W.	Rain a.m. and p.m.
18	65	73	63	29.80	29.85	29.87	S.	Fair, but gloomy.
19	—	72	62	29.90	29.95	29.95	S.	Fair and sunny.
20	62	67	63	30.00	30.00	30.00	S.W.	Rain this morning.
21	62	64	61	30.00	30.15	30.00	W.	Fair, but gloomy.
22	60	62	60	29.98	29.95	29.90	N.W.	Fair and sunny.
23	60	68	59	29.76	29.77	29.65	N.W.	Fair, generally sunny.
24	69	67	58	29.60	29.70	29.66	W.	Rain a.m. and p.m.
25	56	62	—	29.60	29.56	29.58	W.	Rain p.m.
26	60	64	62	29.50	—	—	S.	Fair, but gloomy.
27	58	61	61	29.60	29.63	29.70	S.W.	Fair and sunny.
28	59	63	62	29.71	29.71	29.70	S.W.	Rain this evening.
29	60	63	60	29.75	29.80	29.70	S.	Fair, generally gloomy.
30	62	64	62	29.68	29.67	29.70	S.	Rain this morning.
31	62	62	63	29.60	29.64	29.50	S.W.	Heavy rain this evening.

Summary.				Mornings. Noons. Nights.		
Maximum temperature observed	...	...	...	65°	73°	65°
Minimum ditto	...	...	...	56°	60°	55°
Mean ditto	...	...	...	59°	64°	60°

Mean of whole	...	...	...	61.5°		
Number of fair days	...	...	...	...	...	16
Number of days on which rain fell	...	...	...	...	...	15
Fair days, sunny	...	...	...	...	...	8
Fair days, gloomy	...	...	...	...	...	8

Notes.—The thunder-storm which passed over here in the afternoon of the 13th ult. was of extreme violence—more severe than any storm which has been experienced in this neighbourhood for many years. The rainfall during the storm, which was of about an hour and a-half's duration, amounted to 1.5 inch, while the rainfall during the whole month amounted to 2.81 inches; hence rather more than half the total rainfall of the month fell in about one hour and a-half on the 13th. From the observations as above, the temperature of the month of August, 1875, has been slightly higher than that of the corresponding month last year. So far the harvest has been very successful; the crops are unusually large, and have been got under cover without much rain.

The Photographic News, September 24, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

COPYRIGHT IN PHOTOGRAPHS—PHOTOGRAPHY AND THE ILLUSTRATED PRESS—PHOTOGRAPHY IN THE GARDEN.

Copyright in Photographs.—Photographers do not know how far they are of assistance to the painter and draughtsman, nor are they likely to. Occasionally one may hear a grateful painter acknowledging the aid he has received from the camera of a skilful and experienced photographer; but it is only when an engraving is made direct from a sun picture that the ability and work of the photographer himself is obvious and undeniable. Sometimes the photographer's picture is a bit altered, to hide as much as possible of his work, the outline and idea only being retained; and there is scarcely a photographer of note who has occupied himself in the task of picture-making, who has not recognized work of his own that has been absorbed by the engraver without leave or license. Mr. Robinson, Mr. Blanchard, and, especially, the late Mr. Rejlander, each could have cited a score of instances in which his photographs had been copied by the graver, and reproduced in illustrated periodicals which never paid the original artist a farthing. Studies of individuals are even reproduced in this way, and we remember, a year or two back, on turning over the pages of a German illustrated journal, the *Gartenlaube*, seeing a number of portraits of Mr. and Mrs. Rejlander, which had been taken to illustrate certain expressions of countenance. When we mentioned the circumstance to Mr. Rejlander, that gentleman was quite as surprised at the discovery as we were ourselves. There is another way of stealing copyright from a photographer which is even worse, for in the first case the piracy is so obvious that no one would think of denying it: we allude to the practice of one photographer pirating another's idea. Registration may prevent one from setting up a picture before the camera and reproducing it in this way, but it does not prevent a photographer who has worked out an idea from having such idea copied. Rejlander's popular picture, "Ginx's Baby," was imitated, with more or less success, by several photographers; and this was the case with "Little Red Riding Hood," and a dozen other pictures which found favour with the public, and had made a name. The copy is generally very inferior to the original, and if the pictures were placed side by side for the public to choose from there would, perhaps, be but little harm done; but such piracies are usually pressed upon the retail dealers at a less price than the original pictures, and hence they get freely circulated. If pictorial photographs were produced and sold in larger numbers, it might be worth while, perhaps, for photographers to combine for the purpose of protecting their works more substantially; but at present such a course is, no doubt, hardly worth while.

Photography and the Illustrated Press.—The value of photography to such journals as the *Illustrated London News*, the *Graphic*, and the *Pictorial World*, is well known, and we have already in these columns pointed out to what a large extent our art is employed in the *New York Daily Graphic*, whose illustrations are very often indeed executed from photographs. The latter paper even employs a photo-mechanical process in the production of some of its work, and, as our Paris Correspondent has lately informed us, at the office of the *Moniteur Universel*, which is one of the most extensive printing and publishing establishments in France, arrangements are being made for large photo-printing works, as well as for producing coloured pictures by M. Leon Vidal's photo-chromic process. In this country, although we do not employ a pure photo-mechanical process—except in the case, we believe, of *Funny Folks*, in

which foreign wood-cuts are reproduced from the comic journals of the Continent—photography is used to aid the artist in sketching to a great extent. We can give a good illustration of this. Last week, the big 81-ton gun, the largest and most powerful cannon in the world, was proved for the first time, and the occasion was naturally one of considerable moment. Representatives of the three principal illustrated papers were present during the firing of the monster weapon, in order to reproduce the scene in their papers, but beyond sketching a few outlines of the effect of smoke, &c., very little was done, for a photograph of the gun on its carriage being placed in their hands, their task on the spot was reduced to a minimum. The whole of the measurements and proportions were shown at a glance in these photographs, and so, having taken a comprehensive view of the scene around, the artists had little else to do but transcribe the picture to wood, and finish off the picture in any way that fancy might dictate. One of these days, no doubt, we shall have our papers illustrated by photographs *pur et simple*, but even now, as we have shown, photography has far more to do with the execution of the illustrations in our journals than most people may be aware of.

Photography in the Garden.—We were witness the other day of a very pretty application of light made by a gardener. Everybody knows that the ripening and colouring of fruit are due for the most part to light and heat, and that the roses upon an apple are influenced by the manner in which the sun strikes it. On looking at some fine wall fruit in a Kentish garden, the proprietor called our attention to the manner in which he allowed his peaches to be partially covered by a leaf or two, in places—namely, where he wished them to remain green—and thus heighten by contrast the purple bloom on other portions of the fruit. There were many examples of a leaf being very sharply photographed upon the fruit, and the grower, by exercising a little care during the ripening season, thus enhanced the beauty of his fruit, and also their value, as in the case of a peach it is not only its flavour, but its appearance, which governs the price at Covent Garden.

FRENCH CORRESPONDENCE.

A DICTIONARY OF HEALTH—REMEDIES AGAINST POISONING BY ACIDS OR AMMONIA—CAPTAIN WATERHOUSE'S COMMUNICATION TO THE PARIS GEOGRAPHICAL CONGRESS—PAPYROTYPÉ.

ONE of the most eminent professors of the faculty of medicine at Montpellier, Doctor Fouassagrives, has undertaken the production of a work of the highest interest, which will very soon be seen in all the libraries. It is called the "Dictionary of Health," and it will form a repertoire of practical hygiene for the use of all. I have already seen the first portion of the work, and it contains many things which will greatly interest photographers.

In the first place I may refer to the subject of mineral acids. Sulphuric acid, hydrochloric acid, and nitric acid, which are to be met with in all laboratories, as everybody knows, are so far dangerous that they are capable of producing both burning and poisoning. They must, therefore, be handled with the greatest care, and, for fear of accidents, it is well to know how to combat their injurious effects. If the acid has spread over the face or hands, these must be washed with abundance of water, throwing the latter upon the wounded portions with some force; for the corrosive action of the acid is very rapid.

In the event of the acid having been taken internally, the patient should swallow, in the first place, a large quantity of water mixed with white soap, to the extent of half an ounce of soap to every litre of water; then, as

soon as some lime-water has been obtained, or some calcined magnesia, this is taken also. The lime-water is administered mixed with water, four to ten tablespoonfuls of lime-water to a litre of water or milk; twenty to fifty grammes of calcined magnesia is mixed in the same quantity of water.

In place of lime-water, white magnesia may be employed, or chalk, or French chalk; but these carbonates have the inconvenience of decomposing on contact with acid, and thus vast quantities of carbonic acid are generated, which have the effect of distending the patient's stomach, and causing further pain.

This treatment has the effect of getting rid of the poison, or of annihilating its bad effects; but the patient will still need the attention of a medical man.

Alum is employed in carbon photography, and as the process is every day becoming more wide-spread, there is some reason for photographers knowing the dangerous character of this product. The double sulphate of alumina and potash, without being considered a poison, may nevertheless produce very serious results, and as alum is frequently employed in gargles and such like preparations for affections of the throat, it is well to know how to neutralise the bad effects of this apparently innocent compound when swallowed.

Ammonia taken internally may occasion death. Ammonia vapour breathed in quantity brings about very serious symptoms, and may also place one's life in jeopardy. In both cases the effects are nearly identical.

M. Foussagrives recommends his readers to be very careful about breathing ammonia gas, even when a patient is in a fainting fit; and he cites, in support of his opinion, the following fact:—A lady to whom ammonia vapour was administered to breathe during an epileptic fit, and who absorbed about four grammes of ammonia, very soon succumbed to inflammation of the mucous membrane. The best means to employ in a case of poisoning with ammonia is vinegar and water, which is drunk, if fluid ammonia has been taken; if the patient has merely breathed ammoniacal gas, then he should be permitted to inhale the fumes of vinegar. It is needless to mention that the assistance of medical men is quite necessary in all these cases.

These are some of the points in M. Foussagrives' work of importance to photographers. As Dr. Napier has remarked in his little pamphlet* on the subject of the health of photographers—a pamphlet, by the way, which has been most favourably received in England, I hear—it is necessary that a photographer who has to handle daily so many different products should know something of their effects on the human system, and how to combat or render them harmless.

Captain Waterhouse, of the Surveyor-General's Office in Calcutta, whose name is well known to the readers of the PHOTOGRAPHIC NEWS, has addressed a very exhaustive and interesting communication to the Geographical Congress at Paris upon the subject of the application of photography to the reproduction of maps and plans. The task undertaken by the learned officer was one of considerable extent, for it embraced not only the history of the question, but also a detailed description of all the processes employed till now in the practice of this important branch of the new art. It was necessary for the author, therefore, to study minutely all that has been published since the first, and also for him to possess sound practical experience of the methods brought out from time to time. Not only does Captain Waterhouse possess in a high degree these indispensable qualifications, but he has been able, on account of his position, to get at the true value of the processes which he has described. His memoir is, indeed, a veritable practical treatise, in which specialists will find the most precise instructions; and to give some idea of the work, I may quote the following:—

* This has been reprinted from the PHOTOGRAPHIC NEWS, and published by Messrs. Piper and Carter, at twopence.

"I will now give a résumé of the operation which constitute the ordinary photo-zincographic process as it is now practised both at Southampton and in India. Although modifications have been made in it for the purpose of preventing the lines from being injured on being transferred to stone or zinc, this very good and simple method may be considered as a type; and if one only takes care to secure perfect negatives from the original plan or map, the results furnished can scarcely be surpassed by any other process.

"The most important of these modifications has been elaborated by Captain Abney, of the School of Military Engineering, Chatham, under the name of *papyrotypage*. In this process a small quantity of chrome alum is added to the mixture of gelatine and bichromate of potash which forms the film upon the transfer paper. This addition is for the purpose of rendering the whole surface of the gelatine insoluble, but without entirely withdrawing from it the property of absorbing water. After exposure to light under a negative, instead of being completely covered with a film of ink, the print is plunged into water for a few moments, and then applied to a metal plate. The excess of moisture is absorbed from the surface, and the ink is spread by the aid of a soft gelatine roller. The ink only takes in those parts which have been acted upon by light, and which have become insorbent of water, and capable, therefore, of retaining the greasy compound; while the other parts (where the gelatine has remained sheltered from the light), which absorb water, repel the ink, and remain clean. When the image has been inked all over, it is dried, and exposed to light to harden the gelatine; the action of the light upon the chromium salt effects this, and then the impression is ready for transfer to zinc or stone.

"The advantage of this process is, that all the gelatine remaining upon the paper, the finest lines are not liable to be removed by washing; moreover, the ink lines, being supported to some extent by two walls of gelatine, are not so subject to injury."

ERNEST LACAN.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XVIII.

SENSITIZING THE PAPER—THE PRINTING FRAMES.

A CONSIDERABLE amount of mechanical skill is necessary to properly silver the paper for photographic printing, and on the success of the operation depends the subsequent results and the economy of the department. To find, on cutting up a sheet of paper, most of the pieces spoilt by white insensitive spots caused by air-bubbles between the paper and the solution, is mortifying to the pride, when it is remembered that they are evidences of want of skill or care; and to the same lack of carefulness and skill are attributable other failures.

Unless your work is on a very small scale, it is advisable to silver whole sheets at a time, there being less waste of time and material with sheets than with halves or quarters. The porcelain flat dish is the best kind of dish for holding the sensitizing solution, and the depth of solution should not be less than one inch.

The sensitizing room should not have any inlet for actinic light, or in drying the paper it is liable to get discoloured and spoilt. If you sensitize by a window, shade it with a yellow blind or paper.

In preparing to lay the paper on the bath, first turn up the four corners at about an eighth of an inch from the edge of the paper; this spares you the necessity of immersing the finger to take the sheet from the bath. The paper, previous to sensitizing, should have been kept for a day in a cellar or damp place, especially in dry weather when the albumen is hard, and not only repels the bath

solution, but is apt to crack. It is sometimes well to bend back the edges of the paper by drawing the thumbnail gently all round the sides of the *back of the paper* at about a quarter of an inch from the edges, care being taken not to crack the albumen, that the paper may not have any angles to sink below the surface of the solution, and cause it to flow over the back and spoil it. Place the dish before you, its length being from right to left.

Take the diagonal corners of the sheet in your hands, holding them between finger and thumb, the length of the paper to correspond with the position of the bath, and let the sheet assume a curved position, the left-hand corner being the lower. Place the sheet at this point on the solution, about the centre of the dish, taking care not to touch the solution with your fingers or submerge the paper. Still holding the right hand high, but lowering it gradually, gently draw the portion of the paper in contact towards the corner it will occupy when the entire sheet is on the solution; by the time it has been drawn to this spot (the paper being gradually lowered by the right hand) the entire sheet should repose on the surface of the bath. By drawing the paper over the solution in this manner, air-bubbles are driven before the paper, and if there are any under the paper at all they will be round the edges, and a tap of the finger-nail will be sufficient to liberate them. Frequently, the edges of the paper will curl when first placed on the bath, but gently breathing on them will immediately flatten them. Should there be any drops of solution on the back of the paper, they should be blotted up dry with white blotting-paper.

The paper is now gently lifted at one corner to be examined, and carefully replaced if quite right, and another corner raised; by this means we can detect and rectify any little defect in the original placing of the sheet. Having silvered the proper time, take hold of the left-hand corner of the paper nearest you with the right hand finger and thumb, and slowly raise the paper until you can take the other corner with the left hand; now draw the paper across a glass rod fixed on the left-hand edge of the bath, or if the edge itself is quite even it may be used, so that the superfluous solution is taken from the surface of the paper. The sheet is now placed in clips fixed over the bath, so that any drippings may fall therein. It should be so arranged that any falling drops may run down the side of the dish, and not on to the surface of the solution to cause splashes, or on the back of the paper. The sheet is kept here until another is placed on the solution, when it can be removed to the drying place over the gas jets or stove.

The time of sensitizing the paper, exactly like that of the collodionized glass for the negative, though to a greater extent, is dependent on circumstances, and to state any time is only to mislead: temperature of bath and weather, the strength of the bath, the brand of paper, and the character of the negatives, all have their influence on the judgment of the proper time. It is a matter for personal study. With the plain nitrate of silver bath of the strength given in the last chapter, from forty-five to sixty seconds, under ordinary circumstances, will be about the time in the summer, and sixty to one hundred seconds in the winter.

THE DRYING OF THE PAPER

should not be too slow. The sheets are placed in the rack over the gas jets, a piece of thin metal being interposed between them and the gas. The lower corners of the paper may be prevented from curling by attaching to the lower edge a stick attached to two clips, holding them down during the process of drying. In the summer it will not be necessary to apply more heat for the drying than just enough to banish the slight trace of dampness in the air, so that the gas need not be lighted until the paper is all nearly dry; but on cold damp days the air of the sensitizing room should be warmed to a gentle temperature an

hour or so before commencing the silvering. The economy of allowing the paper to dry spontaneously is very questionable, as so much paper is spoilt by the dead surface resulting, the paper dried quickly and thoroughly giving much finer results on the brilliant and glossy surface of the paper so dried. The paper, thoroughly dry, is ready for

FUMING.

Although fuming may not be advantageous for all classes of negatives, there is no doubt it adds to the beauty of the print in most cases, giving richness, vigour, and brilliancy, as well as rapidity of working in the printing, makes the toning easier, and gives in the finished print a result pleasing and satisfactory. The box for fuming has been already described; into this the paper is placed, and left under the influence of the fumes of aqua-ammonia for fifteen minutes, a little less time being given in very hot than in cold weather. The fumes of the ammonia impart a slight dampness to the paper, which is an advantage in dry weather, but when the atmosphere is moist it may be well to dry the paper after fuming. Should the ammonia have the tendency of slightly discolouring the paper, the addition of a little chloride of lime will remedy it, pouring a few drops in the ammonia saucer. The paper is then cut, and is now ready to be placed in the

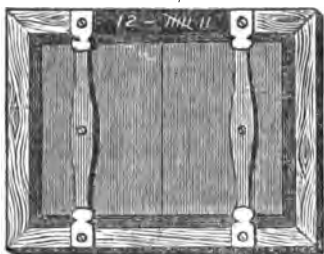
PRINTING FRAMES.

Printing Frames are made of all sizes, to suit the different styles of pictures made. They should be of hard, well-seasoned wood, capable of resisting the influence of all the changes of temperature. For vignettes the bevel in front of the negative should be deeper than in the ordinary frames, to remove the vignetting paper from the print, and thus more effectually diffuse the light, and secure finer results in the gradation of tone. If placed near the negative, the opaque portions of the vignetting paper will print sharply, unless almost impossible skill and care are exercised. The thickness of bevel necessary in vignetting frames is not only unnecessary in the ordinary plain frame, but a positive disadvantage, as, with an oblique light, a shadow will be cast which may spoil the print. The back of the frame is hinged at the centre, and is kept in its place by a spring over each section of the back, to allow of examination of the progress of the print; but the entire back should *fit perfectly* into the sides of the frame, with no room for shifting, or there is great danger, in partially opening the frame, that the print may be moved, and thus a double impression be printed. The examination of the prints should be done in the subdued light of the printing-room; but, as experience is gained, and with it the power of seeing rapidly the state of the print, it may be done in the light, *but the operator should in all cases turn his back to the sun, and thus expose the print in shadow.* I do not think this examination of prints in actinic light is wise, but in the hurry of a large amount of work it may be thought necessary, and I therefore suggest the precaution as absolutely necessary. The inexperienced printer, at all events, should in all cases take the frames to be looked at into the printing-room. The back-board of the printing frame is covered with cloth, or green baize, and pads of either material interposed between it and the paper in contact with the negative secure even pressure, and, of consequence, sharpness of the print, as well as permitting greater pressure on the negative without danger of its breaking.

TAKING ACCOUNT OF THE PRINTS.

This may either be done by neatly marking the corner of each print, advancing the number each time; thus 12.9 being the last mark, on placing the next print in the frame the record 12.10 is made, indicating that it is the tenth of a series of 12; or in each frame a little slate tablet may be *inlaid*, on which the record of prints may be kept. In the

sketch it will be seen that the eighth print is in the frame.



This is one of the best methods of keeping reckoning, especially when the printing of an order extends over several days.

THE PRACTICAL PRINTER IN AMERICA. XXXIX.

COATING, FUMING, AND DRYING THE PLATES.

Coating.—The plate, when albumenized, is then to be coated with the collodio-chloride. For this purpose, take the plate to a room where there is not too much white light—for instance, in the dark room—when the door is slightly opened. Brush away the dried collodion film and whatever dust there may be around the cork, being careful not to shake the contents of the bottle while doing so. Hold the plate with the left hand, level to the floor, having hold of the lower left-hand corner, and take up the bottle of collodion in the right, and remove the cork with the teeth, if you have previously neglected to do so. Pour the collodion at the centre of the upper part of the plate until that half is covered, and then discontinue. Let the collodion flow over to the corners of the plate as I have recommended in albumenizing the plate, and when the collodion is ready to be poured from the plate, take up another collodion bottle (which should be kept expressly for this particular purpose) and let the collodion flow into that. There is a knack in doing this, which consists in letting the plate lie almost level to the floor until the greater part of the collodion has flowed into the bottle; then the plate is raised more perpendicular, and gently rocked sideways, so as to prevent parallel lines forming in the direction of the corner from which it was flowed, which it would do if precautions were not taken to prevent it.

If the collodion is flowed from the plate too quickly, it will be too thick on the bottom of the plate; and if the rocking of the plate is not commenced before the collodion has begun to set, the parallel lines will show in spite of all the subsequent rocking. In drying, however, it will about all disappear.

If the plate is properly coated, it will have an even layer of collodion all over the surface, and will not be at all streaky, but, on the contrary, very smooth. Flow close to the edges and corners of the plate, being careful that it does not run over the sides. Do not remove the collodion which may be a little thick along the sides nearest the corner at which it was poured off, as it will be a great aid in keeping the collodion from peeling off. Keep gently rocking the plate until the collodion is thoroughly set, which is easily determined by placing the finger gently at the corner from which it was poured off, and if the collodion does not adhere, but leaves a mark of the impression of the finger, then you may know that the film is set.

Fuming.—The plate, while still moist, is to be fumed. This can be done in the ordinary fuming-box. Hang up the plate by one of its corners to a spring nipper, and place three or four drachms of the strongest aqua ammonia in a saucer, which saucer is placed under the plate, on the bottom of the box. Fume from two to three minutes, and no more, and then the plate is ready to be removed.

Drying.—This should be done by gentle heat. The plate should be stood up, by support of a side of the negative oven, on one of its corners, and the door is closed. This oven should be heated with a tiny jet of gas, which is capital for the purpose.

When the plate is dry, which it will be in a very few minutes, then remove it immediately, and set it away in a cool place until it cools. If the plate is permitted to get too hot, then the heat will cook the albumen, also collodion, and it will cause the film to be ruined before you have even commenced to print on it, turning it to a very yellow colour. Watch the plate while it is in the oven, so that you will not forget it and have the above-named ruinous results occur. It would perhaps be better for the beginner to hold the back of the plate for a minute or so in front of the door of a hot stove, if he cannot dry it in the oven without forgetting and thus baking it. Baking may be a good thing for "the staff of life," but it is not particularly so for collodionized porcelain plates. Do not take hold of the plate, if it should happen to be very hot, either with wet, damp, or very cold fingers, as the plate will be liable to break.

PORCELAIN PRINTING FRAMES.

For the purpose of printing the porcelain successfully, different printing boards have been invented, which are constructed in a different style from the ordinary negative frames. Those which are now generally used are known by the name of "Jacoby's Porcelain Printing Frames." Use them, viz.:—First it is necessary that a good sharp negative is had, then loosen the thumb-screw on the hinged clamp at the bottom of the frame, place the negative in the clamp so as to rest on the wood at the sides of the padded bed, then fasten by the thumb-screw so as not to move out of position. The strips that rest on the edge of the negative at the sides are for vignetting the picture. Cut a piece of cardboard the size that will slip in the small grooves, with a hole in the size you want.

After placing the negative as above, take a piece of strong paper and put it in the clamp as before, then put some mucilage or wax in the centre, lay your porcelain plate in the position you want it, then throw the wire loops toward each other. This will make room for the plate between the bed and the negative. If it does not fill up the space, the four set-screws at the back of the frame will make it vary just to fit; then print as in any other way.

In printing the porcelain photograph, care should be used not to print too long when separated, and that the space



should not be too much. For heads one inch in size, the space should be about one-twelfth or one-sixteenth inch, and less for small ones. Three-inch heads should be three and one-sixteenth or one-quarter inch, and in all cases the negative must rest on the wood at the sides of the frame; for when you would separate the negative, the negative would follow the bed, and not give any space, and, of course, spoil the picture. Printing should always be done in the shade or under tissue paper.

The "Jacoby Frames" are excellent in all of their parts, being so made as to secure perfect contact between the negative and porcelain, however uneven they both may be.

PLACING THE SENSITIVE PLATE ON THE FRAME FOR PRINTING.

I will only describe how the plate and negative are arranged for printing on one kind of board, viz., "Jacoby's Porcelain Printing Frame." First darken the room by pulling down the curtains, and take the printing-board to the darkest part of the room, away from the window, but

not in such a dark place that you will experience any difficulty in seeing. Loosen the screw which loosens the narrow strip of wood, as seen in the printing frame (see fig.). Place the edge of the porcelain plate under this strip of wood, being sure that the collodionized side is uppermost, and fasten the wood to it by the same screw. The porcelain plate will then be held firmly.

If the plate is a smaller one than is really intended for the size frame which you may have, as a half-size plate, and you may not have but this one 8 by 10 board, you cannot place the edge of one of the sides of the porcelain under the bar, because then you cannot manage the negative so that the porcelain can be advantageously printed. In that case fasten the negative to the frame, as will presently be shown, and place the porcelain plate at the place you wish it, i.e., as near as you can at present tell, and hold the negative over the plate by means of the wood-work, at about a half-inch from it, and move the porcelain so that it will occupy the exact place you wish it to, and then lay back the negative carefully, so as not to move the porcelain in doing so. Now obtain some beeswax, and place a bit on the board close to all of the sides of, but pressed against, the porcelain. Hold the porcelain firmly by the opposite side whenever you press on a particular side, and you will prevent it from being moved. In placing this wax there, be sure that you get none of it on the face of the porcelain, nor should you allow the wax to remain above the level of the surface of the plate, but considerably below it, for you must remember that the face of the negative is coming into close contact with the porcelain, and if the above is not strictly followed out the porcelain will not only move when you raise the negative, but the negative will be spoiled.

The negative is then fastened in a slit made in the bar provided in the printing-frame. This bar is easily turned back when it is required by means of a hinge, and the level of it is raised higher or let down lower, as you may require for the purpose of bringing the negative and porcelain in close contact. This is aided by another bar which is held in position by thumb-screws whenever it is finally fixed in its proper position.

When you are ready to place the negative in the frame, first loosen the screws, place the negative in the place intended for it in the bar, tighten the screws, and lay it on to the porcelain, and it will then assume its proper place, when it is pressed in contact by the hand. Now fasten the screws, and be sure that they are tightened during all the printing. The springs are then placed on to the negative, and the porcelain is ready for printing. To examine the print move the clamp springs, and raise the negative by the bar, and not by taking hold of the negative itself.

MAKING LANTERN SLIDES.

BY E. J. CHUTE.*

As the season will soon be here when the lantern will be called for, every photographer who has a lantern will do well to make up a good collection of slides of local scenery, and portraits from some of his popular negatives, for the purpose of giving variety to his exhibitions.

To those who may wish to do so by the wet process a few suggestions may not be out of place. Some recent practice in making slides only confirms what I have heretofore recommended as to the best methods of working, so that I have but little that is new to add.

It may be hardly necessary to remark that the wet process is the most feasible when slides are to be made from negatives of various sizes.

* Our American friends are generally enthusiastic and thorough in working out any project which they undertake. The use of the magic lantern is at present a favourite hobby, and a monthly tractate is issued by Mr. E. L. Wilson, under the title of "The Magic Lantern," devoted to the subject. Mr. Chute's article appears in its pages.—*Ed. PHOTO. NEWS.*

The first point is to place the negative in such a position that the light from the sky, or from a large sheet of white paper or cardboard, placed at an angle under the skylight, may be transmitted through it. This may be done by working through the window, or any opening in a darkened room, or by using two cameras. In either case it is well to exclude all extraneous light that may enter around the negative. This is easily done by making a mask, or cut-out, of any opaque paper, and placing it over the negative. If the slide is only wanted from a part of the negative, it is best to exclude all the rest in the manner suggested.

A half-size portrait lens with central stops is suitable for this work. Focus with the open lens, and then use the first or second stop, according to the intensity of the light; ordinarily the No. 2 stop will answer best. The time of exposure will vary with the density of the negative and strength of light. With a negative of good quality, and a good light, such as may be had during the best part of the day, an exposure of from thirty to forty seconds will be required. A little practice, however, will teach this better than it can be told.

The collodion for this purpose should be ripe, but not old. I have found a sample of Hanco's double iodized collodion to be all that could be desired. I mixed samples of old and new, which produced a collodion that was very superior. This may be done with any good working portrait collodion. The peculiar qualities to be desired are, a fine, structureless film, and freedom from deposit in the transparent parts of the slide. This last depends somewhat on the condition of the bath.

The bath should not be over thirty-five grains strong, free from ether and alcohol, and sufficiently acid to work without any veil or deposit. The plates should not be allowed to remain in the bath too long, not over five minutes, as a longer time, or any more than sufficient to coat the plate, has a tendency to flatten the image. This might be of little consequence in a negative, but in a lantern positive it may affect it very materially.

For developing, I use the double sulphate of iron and ammonia, from twenty to twenty-five grains to the ounce, with sufficient acetic acid to cause it to flow well. A strong developer is unmanageable, and the slide may be overdeveloped before it can be stopped. When the exposure is right the development proceeds steadily, and its progress may be watched without difficulty. As soon as the details appear to be all out, and while the lights yet seem perfectly clear, the development should be stopped. I have found a saturated solution of hypo more desirable as a fixing agent than cyanide. It clears the slide equally well, and has none of the poisonous qualities of the other.

After fixing and washing, the slide is toned with sulphuret of potash. This is an important point, and its success depends in a measure upon the proper condition of the collodion, to which I have already referred. I choose the yellowest crystals of the sulphuret, and dissolve about twenty-four hours before it is wanted for use. It is then settled perfectly clear, and should be kept corked as a stock solution. To tone, take a three or four ounce vial or small graduate, fill two-thirds full of water, and to this add sufficient of the sulphuret solution to make it of a deep straw colour. Flow this on the plate, being careful to flow it over the whole, so that it may all tone alike. The film will immediately assume a brown tint, growing darker and darker, till in the middle tints it soon assumes a bluish tinge; at this point the image will seem to develop in all its form, and is seen by reflected light; it is then time to stop. The plate is well washed, and when dried presents a beautiful clear positive of a warm tone, and may be mounted without varnishing. The sulphuret gives a surface that is peculiarly firm, and not liable to injury unless brought in contact with some very hard substance. Should a slide be overdone, or too dense, it may be improved by varnishing.

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PICTORIAL BACKGROUNDS TO PORTRAITS.

THERE is a prevalent taste amongst many artists, and more of the public, for some kind of pictorial representation in the background of a portrait. We have heard a sitter, protesting against a plain background, exclaim "I don't want to be taken standing against a wall!" For a simple bust, probably nothing is so really effective as a plain background, duly relieved with light and shadow. A full-length or three-quarter figure, which inevitably leaves a large space of background, does at times look bare and empty if unrelieved by accessories of any kind. But in no case should the background have the effect of closing in the figure like a wall, recalling Hood's lines, suggestive of the desolation of the needle woman's garret,

"With a wall so blank,
That my shadow I think
For sometimes falling there!"

The shadow relieved the garret wall of the drear sensation of lonely desolation; and the due use of light and shadow in a plain background relieves it of the flat, empty sense of art-poverty. The due play of light and shadow in such a background removes the effect of the wall altogether, and gives, in its place the effect of space. But however perfectly managed the plain background may be, there are many who will prefer the pictorial background. It is manifest that if the pictorial effect is obtained by the use of a painted background screen, the variety, whether of landscape or interior scenes, must be very limited, even if—as rarely happens—they are really natural and effective. To secure excellence and variety, it is clear that some method of combination printing must be employed; and it is our aim here briefly to glance at the various methods which are available to the photographic portraitist.

About twelve months ago considerable discussion arose in our columns on the various modes by which landscape backgrounds could be added to ordinary portraits with plain backgrounds, arising out of Mr. Tilley's announcement of a new and simple mode of effecting this addition. None of those entering upon the discussion discovered Mr. Tilley's method, which, having been subsequently patented, will doubtless be offered to the public on specific terms. The specification is not yet published, but is accessible for perusal on the payment of a small fee. Until Mr. Tilley is prepared to make public his arrangements, it is, perhaps, scarcely desirable to lay before our readers full details of a process which they may not use; but we may briefly indicate its character, that it may bear comparison with the other available methods of effecting the same object.

In Mr. Tilley's method the portrait and the background

are produced on one negative by two exposures. No pictorial background screen is used, but a landscape taken from nature and selected as suitable for the purpose. The sitter is first taken with a black background screen behind him, so that the figure is taken leaving all the background space unimpressed. A positive image or transparency of the pictorial scene to be used is then placed in a frame provided immediately in front of the plate bearing the portrait, so that, impressed upon the sensitive film, it may produce a negative of the scene. To secure the passage of light through the transparency, in order to impress or print the design on the background of the negative, and protect the portrait from being impressed by it, Mr. Tilley has devised an ingenious arrangement, which practically constitutes the novelty in his patent method. The sitter remains in position, the black background is removed, and a white background substituted, whilst, by an arrangement of curtains, the light from the sitter is cut off. Thus the light from the white background, passing through the transparency, impresses the design on the sensitive plate, the shaded figure acting as the mask to protect the portrait image on the sensitive plate from further action. The latter, duly impressed with portrait and background, is developed in the usual way, and, of course, no further trouble in masking can arise. The portrait negative has a pictorial background, which may be easily varied at each sitting by the use of a fresh transparency. The process, as will be seen, is both novel and ingenious. How far it can be efficiently worked can only be ascertained, probably, by trial, or by inspection of the curtain and other appliances, which, although minutely described and figured in the specification, cannot be satisfactorily judged without practical examination. In the results we have seen, the pictorial background is introduced without producing line or junction of any kind to suggest combination of two negatives; but in each case that we have seen, the landscape has been too pronounced in definition and general effect; it has lacked the retiring atmospheric character necessary to make the scene essentially a background subsidiary to the portrait. This could, of course, be easily obviated, and must not be regarded as a necessary condition of the process; the full possibilities of which remain to be worked out.

The discussion of this process last year was the occasion of the suggestion and recalling of various other processes. The various means by double printing and by register marks are well-known, and need not be discussed here. Mr. Bovey, and Mr. Bruce, of Dunse, suggested a method in which—the portrait having been printed—a transparent paper negative was to be used for the landscape, the portrait being blocked out on such negative to form a mask. Mr. Werge proposed and illustrated an ingenious plan, in which the portrait, having been produced with a plain transparent ground, was, after finishing, coated with a sensitive bichromate preparation, exposed under a landscape negative, and developed in the usual way with powdered plumbago, taking care, in applying the powder, to avoid touching the portrait itself. This ingenious method, in skilful hands, gave very good effects. A method which we have applied with great advantage was first suggested by the late Mr. Burgess, of Norwich. It consisted in coating the finished and varnished negative, which had been taken with a dark background, with collodio-chloride of silver; painting over the portrait with indian ink, and then exposing under a transparency of any required design which may have been selected for the background. During the fixing and washing the indian ink was removed, and the portrait negative and pictorial background were obtained at once without double printing. Another very ingenious method was the invention, if we remember rightly, of Mr. Johnston, of Wick, by whom it was sold to subscribers as a secret process several years ago. As it is a long time has elapsed, and the sale has

long since ceased, we need not hesitate briefly to indicate the character of the method here. The portrait was here again produced against a dark background, and the desired pictorial background having been obtained on another plate, the film was loosened, floated off, and transferred to the portrait negative in proper position. The image itself, as well as the dark background, was, of course, covered with the landscape or pictorial design. The portion of background covering the image was easily removed by means of a camel's hair or sable pencil and a solution of iodine and hyposulphite of soda, which at once dissolved the silver material forming the image. Some exceedingly clever examples of combined negatives were produced by this method.

There still remain one or two other methods involving combination printing, but presenting especial facilities for effecting this satisfactorily. By the use of background negatives, prepared expressly for the work like those issued by Mr. Bendann in the United States two or three years ago, combination printing is made very simple, the characters of the background—some ordinary interiors, some alcoves, &c.—being contrived so that the masking shall be easy, little risk of lines round the figure being involved. The use of paper negatives for enlargements, or transferred films like those proposed by Herr Warnerke, also present ready facilities for combination printing in a manner we need not indicate in detail here.

In all systems by which pictorial backgrounds can be secured in portraits, two or three principles should be borne in mind. It is scarcely necessary to say there should be congruity and keeping. A lady in evening costume should not be placed in an open landscape which suggests remoteness from habitation or shelter, nor would a workman in fustian appear at home in a highly decorated interior. The lighting of the background should be harmonious with the lighting of the figure. This is too obvious to need enforcing, and yet we have often seen the law violated. Finally, a background should always be subsidiary to the figure, and retire, instead of challenging attention by its vigour equal to that of the portrait. As a rule, the definition should not be too crisp, and the light and shadow not too pronounced. The lights should be less obtrusive than the principal lights in the portrait, the shadows less intense than the deepest shadows in the figure. Distance always tends to reduce the contrast of light and shadow, and a background is more effective for appearing distant. The exquisite little gems by Mr. Edge, of Preston, which excited much attention a few years ago, perhaps carried this principle a little too far; still, we can commend them for a study if not for absolute emulation.

EXHIBITION OF THE ROYAL CORNWALL POLYTECHNIC SOCIETY.

THE Photographic department of this Exhibition, as was noticed last week, was numerically stronger than usual, two exhibitors alone sending forty-eight pictures between them. Colonel Stuart Wortley's collection of life-size studies and instantaneous sea and cloud scenes, for which a first silver medal was awarded, are familiar to the public, rendering description of them here unnecessary. Chaffin and Sons' single figures and groups on plates twenty-four by eighteen inches have fine qualities, although somewhat low in tone. Their "Chess Players," a group of three young ladies standing around a chess table, shows the difficulty of securing all the elements of a picture by photography. Here the technical qualities are admirable, but the expression in the models of concentrated attention involved in working out an interesting or intricate problem of the noble game is scarcely secured. David Hedges must have some speciality by which to secure the attention of his animal clients, and induce such charming and unconscious quietness. Surely he must

practise animal magnetism; his pictures certainly well deserved the first silver medal awarded. Mr. W. Nicholson's "Bow Church," and two others, are clean, quiet, and sharp pictures. Messrs. Robinson and Cherrill have possibly sent in previous years finer pictures than "The Little Bridemaid," or "Flowers," or "The Passing Stranger," and "The Gleaner;" but being skyed in the hanging, it was difficult, if not impossible, to form a correct estimate of their merits. Mr. Nesbitt, an exhibitor for the first time, obtained a second silver medal, the special picture being a ten by twelve portrait of a young lady, full length, sitting, and in a light dress, which is certainly effectively managed.

This exhibitor has also several attempts at *genre*, the best, and in which, perhaps, the story is best told, is "She will recover," a mother intently watching over her sick child. Some others, meant for open air subjects, have, perhaps, too much suggestion of studio work, the painted background in some degree marring otherwise good intentions. Mr. Benjamin Wyles' "Studies of a Sunset," and "Clondland," are very fine, and the judges must have thought something considerable of them, as they do not usually award first bronze medals to such small pictures. Mr. W. Brookes' only exhibit was certainly well worthy of the first bronze medal ticket attached to it, for a more magnificent "Study of Trees" is rarely seen. Mr. Drew's fine collection of Warwickshire scenes, for which he received a first bronze medal, suffer somewhat from the mounts, which would have been better of toned card mounts. Mr. J. M. Young obtains his first bronze medal for some very good twelve by fourteen portraits in the style which photographers have agreed to name "Rembrandts." The only other professional exhibitor to receive award is E. P. Lee, of Cardiff, a first medal for some very pretty "Ceramic photo enamels, coloured."

It is difficult to conceive why no mention is made of F. M. Sutcliffe's collection; his "Tired of Waiting"—a young lady at a stile, from whose pose it is evident she is anxiously waiting for the appearance of some one else, and the little boy-brother probably, fast asleep at the hedge-foot, tells how the time has passed away, and made the watcher tired of waiting. It is certainly one of the most effective story-telling pictures ever exhibited here; and the same may be said of "Fish," a large and full-length figure of a cook gazing intently at a basket of fish on the house door-step. His

"Like pine trees dark and high,
Subdue the light of noon,"

was also exceedingly rich and effective. Nothing can be finer than A. and J. Bool's "A Hampshire Lane," a much finer photograph than their last year's silver medal picture, "On the River Wey." The judges awarded him a bronze medal this year, which, we understand, the rule precluding the award of prizes to the same person two years running, will prevent his receiving. Of Mr. H. Garrett's collection of seven, "Sam Weller" is decidedly the best, and may be deemed a success. John Terras' subjects are ideas well carried out, but they are too small to receive much notice. Mr. Reuben Mitchell, having taken a first bronze last year, cannot, we understand, any more than A. and J. Bool, receive the second bronze, which the judges this year very naturally thought due to his "Kilchune Castle, on Loch Awe." In both these cases, whether the rule be enforced or not, there is at least the satisfaction of meriting the award.

In the amateur collection Mr. Crawshaw's large collection of thirty was very diversified—life-size head and bust, ten by twelve portraits and views. His prize (first silver medal) picture was certainly the most effective and artistic of all the life-size studies in the room, while his ten by

* "Who there is in the house! There's a wooden leg in No. 6; there's two pair of halves in the commercial room; then there's these here painted tops in the snuggery inside the bar; and five more tops in the coffee room.—DICKENS.

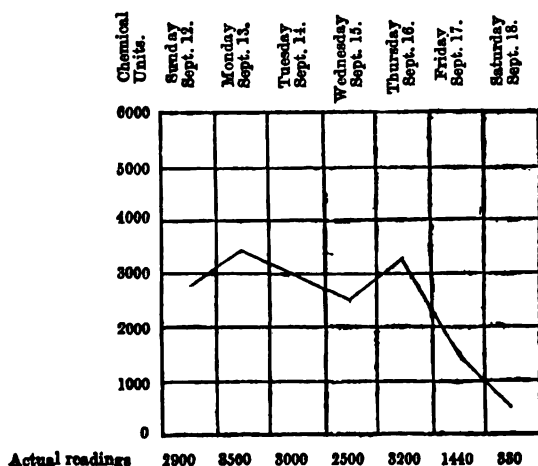
twelve portrait of the Marquis of Bute would hold its own against any professional portrait exhibited. Mr. Grant's "Bits in Russian Lapland, many of them taken at midnight," were not only interesting, but fine specimens of the art; and the same may be said of Mr. Ferneley's "Melton Views." Mr. Grant received an award, but is debarred from receiving the medal by the rule referred to.

In conclusion, it may be remarked that, whilst the department was certainly an interesting one, and contained much fine work, there were none of the noble works—of which we may mention "Bringing Home the May" as a type—which render special exhibitions historically memorable.

METEOROLOGICAL REPORT OF THE AGGREGATE OF CHEMICAL FORCE IN THE DAY-LIGHT OF THE SOUTHERN SKY, THE OBSERVATIONS BEING MADE AT BLACKPOOL, LANCASHIRE.

BY D. WINSTANLEY, F.R.A.S.

THE appended report is for the week ending Saturday, September 18th. The figures given, though reliable amongst themselves, refer to a purely arbitrary standard not yet correlated with the standards now in use. The observing plane of the instrument is vertical, and its aspect to the meridian of the place. The sensitive material used is silver chloride, and the daylight whose power is measured confined to such portions of the spectrum as affect the haloid named.



GERMAN CORRESPONDENCE.

BY DR. VOGEL.*

VIENNA MEDALS—NEW ELECTRICAL PHOTOMETER—ON THE VARIATION OF THE TRANSPARENCY OF THE ATMOSPHERE—AUSSELDRUCK—CURIOUS THINGS IN AUSTRIA.

THE list of medals awarded at the late Vienna Photographic Exhibition has recently been published. Of the one hundred and seven photographic exhibitors, just one hundred have received awards, and only seven were left without any. There were sixteen silver medals awarded, of which not one was for portraits; only Robinson received such, for combination prints. Forty-five bronze medals, among which is Dr. Woodward's, of Washington, D. C., for micro-photographs. The remainder received honourable mention.

Lately there has been constructed by Herr Siemens, of this city, the celebrated electrical and telegraphic manufacturer, an interesting photometer. Lieutenant Sale discovered several years ago that crystalline soda possessed

the peculiar property of conducting electricity better when lighted than in the dark. Sale further found that the conducting property is increased with the intensity of the light, and that the rays which have the most effect on our eyes—i.e., yellow, green, and red—also have the strongest effect on the soda plates. It is singular that the soda is not materially affected by the warm rays. Siemens has applied this property to the construction of an electrical photometer. He incloses crystalline soda between two mica plates, and places it at the bottom of a tube. The soda is placed between two wires, of which one side is connected with a galvanometer, and the other with a thermo-electrical battery. The latter generates electricity by warming, which the needle of the galvanometer diverts. As soon as the tube is opened, the diversion immediately becomes greater, even if the flame of a gas jet shines in the tube, for the diversion increases with the intensity of the light. Siemens has already used the apparatus repeatedly, and its sensitiveness is quite astounding. I am satisfied that this invention will yet be of some significance to photography. It would only depend here, that the soda should be exposed to the blue rays. This could be done in a manner suitable for practice by covering the tube with a cobalt glass. It is then only necessary to place the tube in such a place in the atelier where the person to be photographed is standing; the other parts, battery and galvanometer, can readily be placed somewhere else, from whence they can be placed in connection with the tube with wires. If the tube is opened a short time before a sitting, and notice is taken of the galvanometer, you have immediate information of the state and intensity of the light, and can regulate your exposure accordingly. It is, moreover, highly probable that other elements besides soda contain similar properties.

In your May issue I wrote you about my spectro-photometrical observations in the Red and Indian Oceans, and about the extraordinary changes of the light-intensity of the single colours. I have pursued these phenomena, and have proven repeatedly that which is in direct opposition to the hitherto general opinion. It is universally conceded by photographers that the light in the morning is better than that in the afternoon. On the ocean I observed repeatedly just the opposite—i.e., the chemical intensity of the light was greater at 5 p.m. than at 7 a.m. The reason for this can be found in the atmosphere of the ocean being clearer. On shore, and, especially in large cities, the transparency of the atmosphere is diminished as the day advances. Smoke issues from innumerable chimneys, which colours the atmosphere yellow; dust arises from the streets, which also has a yellow colour; and at noon the atmosphere is filled in such a degree that the effective photographic rays are absorbed, to a certain extent, more than in the morning. According to the ordinary perception, the chemical intensity increases with the rising of the sun. This is correct if the atmosphere retains the same transparency. In fact, however, the atmosphere changes quite perceptibly, through the vapour bubbles floating in the air. These are present even on clear days, and cause the so-called air prospection. They weaken the effect of the direct rays of the sun very perceptibly, and sometimes the blue ray is weakened more than the yellow. On the 5th of March I observed, for instance, in the Red Sea, that the yellow acted more energetically than the blue and violet rays. It must here, however, be remarked that when the chemical action of the direct rays of the sun are weakened by vapour bubbles and delicate foggy clouds, the light of the blue sky, on the contrary, receives a strengthening. It is, of course, known that scattered white clouds on the sky have a more energetic effect than the clear sky.

For some time past a new printing process has been the source of some talk, which is evidently produced by the aid of photography, of the particulars of which, however, very little is known. The process was invented by Aubel, of

* Philadelphia Photographer.

Cologne, and is called Aubeldruck. The prints are mostly reduced reproductions of line and crayon drawings, some in the style of Lichtdruck, and others in the style of a lithograph, and are of an astounding fineness. The firm furnishes not only finished prints, but also transfers on zinc, which can be readily etched-in with acid, and can then be printed in an ordinary printing press. There have been many of these processes published here, and the subject forms the theme of animated discussion in typographical circles, without any one being able, however, up to this date, to gain any idea of the secret. I hope to be able to send you some samples in the next.

In Austria another object is the cause of animation in photographic circles. It is the prohibition of transporting gun-cotton on the railroad, even in a moistened state, on the ground of being dangerous. The comical part of it is, that the transportation of the far more dangerous compound, dynamite, is allowed in Austria.

THE NEW EMULSION PROCESS, WITH NEW IMPROVEMENTS.

BY SIGMUND SINGER.*

IN my opinion there is no process, not even the wet one, so simple and so uniform in its results as the one I am about to describe. The negatives are of a great delicacy and of beautiful non-actinic colour. If my way of developing is adopted, the process of development is shorter than in the wet process, and the negatives develop to the full intensity with the ammonia solution alone, and one to three drops of a sixty-grain pyro solution added.

Mr. Newton has made the great discovery that an everlasting bromide emulsion can be prepared by using an excess of nitrate of silver at first, which is permitted to ripen until it turns creamy; the excess of silver is then turned by adding a chloride, so as to have an excess of chloride.

Such an emulsion is very sensitive, and works clear from fog. Another advantage of this emulsion is, as no free nitrate exists, the plates do not need any extra washing, a simple transferring to the preservative bath being all that is necessary.

I have discovered still a new feature and improvement in connection with an emulsion of this nature, by which the whole process is still more simplified and more certain, and superior results are obtained. It consists in adopting an alcoholic organifier (preserver) instead of an aqueous solution. Such an article being prepared, it is put in a convenient vial, and, after the film has set, flow it over the same, as collodion, allowing it to remain a few seconds on the film, which can be used right off, or allowed to dry, which it does in a short time. No stains or marks will appear. The plates are more sensitive, and the development actually beautiful, and more especially so if my mode of development is adopted.

I will now give my formulæ. In the first place, an emulsion is prepared according to Mr. Newton's process, whose excellent paper on emulsions everybody ought to read:—

1. Bromized Collodion.

Absolute alcohol	...	...	3 ounces
Ether	...	...	5 "
Pary's cotton	...	...	86 grains
Double bromide of cadmium and ammonium	...	...	80 "

2. Emulsion.

Bromized collodion	...	...	1 ounce
Nitrate of silver	...	...	17 grains
(Dissolve in two drachms of hot alcohol)			

The emulsion is formed in the usual way. This emulsion will have now an excess of free nitrate of silver of from two to three grains per ounce. It is set away to

ripen, for about ten or twelve hours, then it will get creamy and reach its maximum of sensitiveness. After this time one and a half grains pulverized chloride of calcium is added, shaken up, and the emulsion set aside for about six hours longer. It is then filtered as usual, and fit to use.

1. Alcoholic Organifier.

Alcohol	...	...	8 fluid ounces
Tannin	...	...	12 grains
Salicine	...	...	12 "
Gallic acid	...	...	5 "

After the solution add a piece of caramel sugar, and leave in the liquid until the same assumes an orange colour, then pour off and filter.

MANIPULATORY DETAILS.

Coat the plates evenly with the emulsion as usual; the film sets almost instantly. Have the alcoholic organifier in a convenient vial, and flow over the solution the same way as collodion. Leave the solution in contact with the film a few seconds, to let it absorb some, and drain off the surplus in the same vial. The organifier does not get spoiled by this; on the contrary, it keeps improving all the while. The plate can be used right off; or, what is in my opinion better, it can be set away to dry, which will take place in a very short time. Drying stains or air-bubbles will not happen, and the film dries up to a clean bright surface. It can be hastened in drying by using a moderate heat, but it will not be necessary, as there is no objection to using the semi-moist plates. The exposure can be a short one, but a full exposure produces the best results.

THE DEVELOPMENT.

1. Ammonia Solution.

Distilled water or rain water	...	...	12 ounces
Concent. aqua ammonia	...	...	1 fluid ounce
Bromide of ammonium	...	...	12 grains

2. Pyro Solution.

Pyrogallie acid	...	...	60 grains
Alcohol	...	...	1 ounce

My development differs entirely from the modes of alkaline development I have seen described. It is as follows:—After having wetted the film with water and drained again, I pour a sufficient quantity of the ammonia solution (1) in the developing cup (say, for instance, half an ounce) and apply to the film, and keep it on the film a few seconds to insure uniformity of action. I now drop a single drop of the pyro solution (2) in the cup, pour back the ammonia solution from the plate to the cup, and re-apply. If the exposure has been full, the picture appears with vigour in all its details, and one or two drops of pyro applied as before will furnish the density of the negative. In fact, by the gradual addition of pyro you can make it so dense that you cannot see through it without danger of fogging; but it is recommended to stop when the picture is vigorous, and get off the yellow semi-transparent tint, as it dries up to a beautiful non-actinic colour, and the deepest shades will then be represented by clear glass, with all the delicate modulations of the middle tints.

Fixing Solution.

Hypo	...	...	1 ounce
Water	...	...	8 ounces

I have given this alcohol organifier, which, with my system of working, has given me beautiful results, but almost any other alcoholic extracts will give good results. I have tried alcoholic extract of coffee; also of tobacco. One ounce of alcohol with two grains acetate of morphia is a simple preparation, and gives good results. I have also tried Mr. Newton's preserving substances, laudanum and nux vomica, put up in alcohol, with good results. I have not had the least trace of blurring with those plates, which I ascribe to the colouring properties of the caramel sugar. But should an inconvenience with some emulsions take

* Philadelphia Photographer.

place, the alcoholic organifer can be tinted to any intensity required by an alcoholic solution of sandalwood, alkanet root, or perhaps by aniline colours. This will also prove an easy way to tint the film for the purpose of Dr. Vogel's spectrum experiments in various colours, without spoiling the emulsion itself, by adding this colouring substance to the same, as proposed by him.

With care no substratum is needed, more especially if these plates should be exposed in the semi-moist state; otherwise albumenized plates can be used, but the albumen solution must not contain any ammonia, as this strong ammonia developer re-dissolves the substratum prepared with ammonia. Use one quart of water and one egg albumen, to which add one-half drachm acetic acid No. 8, or one-half drachm carbolic acid; both preparations will keep in a cool place a long while, and will stand my mode of development. A one-grain gelatine solution with a little alcohol added can be used, though I prefer the albumen.

I believe that with the adoption of the alcoholic organifer, as proposed by me, and an emulsion of such composition as described, there will be no need of the expensive and laborious pellicle process; the plates being finished just as fast, and are a great deal more sensitive than the pellicle. But even to the pellicle process an alcoholic organifer can be applied with advantage, which certainly will be safer, and just as fast and efficacious, as to add the organic substance to the emulsion, which deteriorates the latter, and is the cause of stains.

How far an alcoholic organifer can be used with emulsions prepared with excess of nitrate or bromide I have not tried yet, as the process described has given me the highest satisfaction; but I have no doubt it can be modified so as to answer for these emulsions.

In the whole process I have not met with a single failure, and had not the least trace of fog on the plates with the most careless manipulation. In fact, the coated plates, before being flowed by the organifer, can even stand a little white light without great injury. It is the organic substance which gives to these plates their high sensitiveness, and I am confident that we will find, in connection with our alcoholic organifer, some alkaloid yet which will give those plates such an exalted sensitiveness as to enable them to compete successfully with the wet process in this respect, as it does already excel it in simplicity of manipulations and uniformity of results.

I can also recommend every worker to try my system of alkaline development, as the results are better, and certainly cheaper, than when the development is commenced with a three or even a six-grain pyro solution. I have also tried this system of development for gelatine-emulsion plates with good results.

How long these dry plates will last I have had no chance to test. I think they will last as long as any, but this is of minor importance, as by the simplicity of the process a great many plates can be finished in an hour. A vial with emulsion and a vial with the preserver are all the paraphernalia necessary, and it is therefore useless to produce a large stock of plates for future use.

To make Caramel Sugar.

Sugar	...	...	...	...	1 ounce
Water	...	...	...	...	1 drachm

Heat in an evaporating dish until it attains a brownish-black colour, and exhales an empyreumatic odour. Let it cool, when it will harden up to a black mass. I add this to the alcohol, for the double purpose of colouring the solution to prevent blurring, and on account of the bitter principle contained in it.

To Prepare Double Bromide of Cadmium and Ammonium, used in my Formula.

Ammonium bromide	...	...	...	196 grains
Cadmium bromide	...	...	...	276 "

Dissolve in smallest quantity of water possible, and

evaporate to dryness in a dish, by a moderate heat, stirring with a glass rod at the end to granulate the salts.

Finally, I think I will confer a boon on all emulsion workers, who are not aware of it, that the stains of the alkaline developer can be effectually removed by a saturated solution of oxalic acid. This solution will also remove most of the other stains which are met in photographic practice, such as iron stains, bichromate solution, &c.

SILVERING GLASS FOR MIRRORS.

BY DR. HENRY DRAPER.*

THE following is the process for silvering I most frequently use. The quantities given are those necessary for a 28-inch mirror, and will make a bath of 160 ounces. In silvering smaller pieces you can estimate the amount necessary by supporting the glass half an inch from the bottom of the vessel in which you are going to silver, and measuring the fluid that is required to reach the face, but not overflow the back.

There are three solutions: A, B, C.

A.—Nitrate of silver	...	...	...	337 grains
Water...	...	...	...	10 ounces
B.—Potassa pure by alcohol	...	...	...	1½ ounces
Water	...	...	...	25 "
C.—Milk-sugar in powder	...	...	...	1½ ounces
Water	...	...	...	10 "

Pour nearly all of A into a vessel that will hold 160 ounces; add ammonia, drop by drop, till the grey precipitate clears; add 20 ounces of B, and just re-dissolve the brown precipitate that forms with ammonia. Make up to 75 ounces with water, then add some of A till a grey precipitate that does not redissolve in three minutes is left. Then make up to 150 ounces with water. Let it settle, and pour off. When ready to immerse the mirror, add all of C; pour quickly, after stirring into the silvering vessel, and immerse the mirror face downwards.

The glass must be thoroughly cleaned with nitric acid, and then rubbed with pure alcohol.

When the silvering is complete, wash it thoroughly, and set it on edge to dry. When perfectly dry, rub it with a piece of the softest buckskin, and finally polish with soft buckskin and the finest rouge.

ALBUMEN AS A SUBSTRATUM.

A CORRESPONDENT of the *Photographic Times* (U.S.) says:—

"I albumenize every glass I use, and for the last year and a half have not seen a spot, speck, or particle of fog in any way traceable to the albumen. It does not get my bath out of order, and out of the last two thousand negatives I have made, there is not the slightest veil of fog in any one of them from any cause.

"When I first commenced using albumen as a substratum I experienced considerable difficulty with foggy baths and various other annoyances, but as I never was a good hand at cleaning glass by muscle, and never had an assistant whom I could 'bet on,' and was by no means certain, when I got a clean plate and a good negative, that the film would stay on the plate until it was washed, I made up my mind to use albumenized plate, if I had to doctor my bath every night, never doubting but I should make a success of it in the end. I read every article I could find upon the subject, quizzed every operator I met with, experimented in every way I could think of, and I found it, no matter how nor where, but here it is. Take a five-pint bottle, put into it a handful or more of broken glass, the white of one egg, six or eight ounces of water (not distilled), 30 grains of iodide of potassium, 15 grains bromide of potassium, an ounce and a half of liquid ammonia, shake

well, then fill the bottle within two inches of the neck with water (not distilled), give it a few more shakes, and it is done, and will work just right every time. Now filter through paper what you require for immediate use, cork up the balance, and set it away for future use; if you should not live to use up the whole amount, your children may have use for it, and it will keep.

"Now I will tell you how I clean my glass. For cleaning off old negatives, or any glass that has previously been albumenized: leave them over night in a solution of concentrated lye (one box of the lye to a pailful of water), wash them under the tap with a sponge, then run them through nitric acid 1 part, water 10 parts. Do not put new glass in the lye solution; simply leave them over night in the acid. Now take a soft piece of linen, wash the glass well on both sides and all the edges, rinse under the tap, and flow (while wet) twice with the filtered albumen; throw the residue in the sink; do not try to save it; it is no good, besides, it is cheap. Set the glass up in a drying rack, and be careful that the corner you let go of is not the upper one; the less dust you have flying around, the better the ultimate result. Follow these directions to the letter, and you will not have the slightest trouble in using albumenized plates. Make any variations, and I will not warrant success.

"In speaking of water, I have said 'not distilled,' and were I writing a book on photography, I think I should have for a sub-title, 'no distilled water.'

"Two years ago I washed out my sink with five gallons of that article, allowing it to quietly run down the waste-pipe, and that is the last and best use I have made of distilled water during my more than twenty years of shadow chasing."

ON GLASS-PAPER, EMERY-PAPER, ETC.

The *English Mechanic* gives an abstract of a memoir which has been presented by M. L. A. Chateau to the members of the National Academy of Paris, on the production of glass-paper and similar substances for cleaning or polishing purposes, which may interest our readers. After showing that the Egyptians and other ancient peoples possessed the knowledge of polishing stones, &c., and that this process was almost universally effected by means of the friction of two similar bodies, the writer proceeds to point out the gradual steps by which, from employing loose powders, adhering to a stick by means of a little moisture, arose the Swiss "cabrons" (peculiar kinds of buff-sticks loaded with fine emery, and now used by the watchmakers), and lastly, that from these sprang the idea of a pliable yet sharp-faced material, such as emery-paper.

"The powders which are actually used as polishers are diamond-dust or bort, which is prepared by rubbing the sharp edges of black diamonds, fixed in wooden handles, against one another. The present value of bort is something like 48,250 francs the kilo., equal to about £873 6s. per lb. avoirdupois.

"Tripoli is the general name given to all siliceous powders, of a reddish colour, and harsh to the touch. Sometimes it consists of the detritus of stones worn off by running waters; at other times it is composed of the innumerable siliceous coverings of fossil diatomaceæ. Venice tripoli is the most esteemed. Sand is really nothing more than finely-divided flints.

"Sandstone is a rock consisting of a sandy basis intimately mixed with a calcareous paste. Some specimens are very hard, and such are used as grindstones.

"Putty-powder is an oxide of tin, principally employed for the final polishing of glass."

"Colcothar, a sesquioxide of iron, is also largely used as a polishing agent.

"Emery, an impure, but crystallised form of alumina, is the agent most generally used for cleaning and polishing metals. Its great hardness recommends it for this purpose,

being nearly equal in that quality to the diamond. The hardest varieties come from Greece.

"It has been found that much of the powder lately sold as emery was a sophistication consisting really of the powdered slag from the iron furnaces. As this powder does not touch steel, it may cause considerable annoyance and loss of time.

"Glass.—Of all the varieties usually employed, it would appear that green bottle-glass is the best. This is doubtless in consequence of the amount of silicates of alumina and iron which it contains, and its consequent greater hardness. Experiments have not been tried in this direction, but analogy would lead us to infer that the crystallised forms of lime and alumina glasses, known as "devitrified glass," or Beaumur's porcelain, would be particularly serviceable in the preparation of the 'sandpapers.' In the preparation of the above materials, for this special purpose, great care is necessary in their pulverisation. It is evident that, besides the due selection of the size of the particles constituting the powder, which must vary with the peculiar use to which the paper or cloth is destined, the shape of these particles must form an important element in the question. For this reason, M. Chateau strongly deprecates the use of horizontal millstones, or cylinders, in crushing these various bodies, as tending to take off the sharp edges of the resulting fragments, but gives the preference to stamping mills, in which the fragments are separated in the form of minute splinters, with the cutting edges intact. A paper prepared with a powder possessing this latter form will do considerably more work than one covered with rounded grains, or flat shivers. There are, however, cases in which it is sought to give a polishing, and not a scratching or cutting, surface to the paper: in these cases, the powders must be brought to a state of impalpable fineness, by rotary grinding and repeated elutriation. M. Chateau called the attention of the members of the Academy to a special paper prepared by him, which, though prepared with emery, had so exquisitely fine a surface as to produce a brilliant polish on metallic surfaces, without any scratches being perceptible, being in its effects equal to the finest colcothar or putty-powder. The quality of the paper on which the powders are mounted is also worthy of attention. For large and heavy metal work, paper made from oakum seems, by virtue of its fibrous structure, to be the most adapted. Tough, without being brittle, it takes well to the glue employed to fix the powders on the surface.

"For finishing off the fine steel work and brass work of philosophical instruments (*instruments de précision*), a fine paper, made of chosen materials, is preferable. M. Chateau gives the preference to the stout blue paper found in the French market, as it has neither humps nor roughnesses on its surface.

It was long customary, and is actually a frequent practice even now, to roll the surface of the paper after the application of the cutting powder, but this custom is very injurious to the good qualities of the paper. True, it serves to drive into the texture of the paper those large particles which, through careless sifting, may exceed the general level of the surface; but by either crushing or laying down in one direction the splintered particles, it completely takes off the sharpness due to the presence of free and cutting edges. Sifting the prepared powders over the surface of the glued papers appears to give the best results for the coarser, or cleaning papers; for the finer varieties the introduction of the glued papers into a chamber in which a "dust" of the fine powders has been created, seems to be the most equitable distribution, and satisfactory result. Attention has also been turned towards rendering the coating itself less liable to detach and split off from the paper. This defect depends in great measure on the glue itself. M. Chateau has succeeded, by a process which he does not communicate, in producing a coating which can be bent to any desired extent without tending to detach from the paper. Several trials had been made in this direction; solutions of caoutchouc, of gum, resins, &c., had been tried, but they were

found to soften when rubbed briskly, rolling up, and making a disgusting mess.

"Probably the addition of a very small quantity of some hygroscopic body, such as sugar, salt, &c., would confer on ordinary glue sufficient flexibility to render it the best substance for the purpose. The expression made use of by M. Chateau in the pamphlet, 'I have sought to modify the glue' tends to strengthen our belief that the basis of his elastic coating is glue."

Correspondence.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

DEAR SIR,—As one of the Judges in the Photographic department, will you kindly allow me, through the medium of your paper, to correct an error which appeared in your last issue, otherwise, as it stands, it may mislead competitors in future.

After mentioning the names of those who won medals at the present Exhibition, it states, "The Judges also named A. & J. Bool, Reuben Mitchell, and W. J. A. Grant, but these exhibitors having had awards in the two past Exhibitions, are by a rule of the Society barred from taking prizes in the succeeding year."

The reason they were barred is, not because they had awards before, but because they won medals of a higher value, (at one of the two preceding Exhibitions) than those awarded to them this year. Consequently, by the rules of the Society, they could not receive any. It would not have been so had the awards been higher than those received previously. For instance, one of the gentleman named, won a second silver medal last year, consequently, he must have a first silver medal this year (or at future exhibitions), or none.

—I remain, yours truly,

THOMAS HART.

Polruan, Lizard, Sept. 21st.

Talk in the Studio.

CORNWALL POLYTECHNIC EXHIBITION.—We are requested by Mr. Edward Kitt, secretary to the Royal Cornwall Polytechnic Society, to mention that in the official report of the awards in the Photographic Department, which appeared in our last, the contributions of Col. Stuart Wortley were by mistake named amongst those of professional competitors, instead of amongst those of amateurs, to which class they belonged.

AUTOTYPES OF HOUSE OF COMMONS.—We learn from a daily contemporary that Autotypy has been employed to reproduce a historical picture of the House of Commons of 1874, just completed by Mr. F. L. Sargent, who had one of the committee rooms allotted to him as a studio, to facilitate sittings from honourable members. The *Daily News* says:—"Honourable members lent themselves with alacrity to the carrying out of the scheme, and, almost without exception, sittings were obtained from every member, not excluding the Speaker. The picture was finished in the closing days of the session, and was placed by Messrs. Henry Graves and Company, of Pall Mall, in the hands of the autotyper. The process of reproduction has been singularly successful, and the result is a handsome autotype, which presents what is, perhaps, one of the most artistic and faithful representations of the assembled House of Commons ever published. There are nearly 400 portraits in the picture, and by skilful grouping, whilst each face is fully shown, the picture is free from that stilted, "wooden" look which frequently mars artistic enterprises of this kind. The scene is taken at a moment when Mr. Disraeli is addressing the House, and the right hon. gentleman is, perhaps, the only exception to the general excellence of the portraits, a mischance which doubtless arises from the fact that the Premier has a rooted objection to sitting for his likeness, and could not be induced to overcome it in favour of Mr. Sargent. Mr. Gladstone, on the other hand, is sketched with the faithfulness of a photograph, and the likeness of the Marquis of Hartington is scarcely less successful. Among members on the Liberal side whose like-

nesses stand out with great distinctness are Major O'Gorman Sir Wilfrid Lawson, Mr. Whalley, Mr. Plimsoll, and Mr. Horsman. The Ministerial side has rather an advantage, the sketched being taken from a point behind the chair of the Sergeant-at-Arms; the members on the right of the Speaker consequently come into fuller view. This remark particularly applies to the Treasury bench as compared with the front Opposition bench, and Mr. Cross, Sir H. Selwyn-Ibbetson, Mr. W. H. Smith, and Lord Henry Lennox specially benefit by the accident. But the likenesses are nearly all perfect, and the picture as a whole possesses a value beyond that of its unquestionable artistic merit."

To Correspondents.

A. A. CROSSIN.—Messrs. Anthony have no house in London, but their goods can always be obtained of Mr. Atkinson, of Liverpool, who keeps a large stock of American photographic material. The representative of Messrs. Anthony in London is Mr. Bidean; his address is, care of Messrs. Starr and Co., 22, Moorgate Street.

INDUSTRIOUS.—It will be better to have the sentences written in black on white cardboard, in a bold large style, and take a reduced picture of the size required. 2. The magic lantern and sciopticon are practically the same thing, the sciopticon being an improved lantern which yields a very well illuminated image with a paraffin lamp. 3. The question of price is one into which we cannot enter in this column. The sciopticon is the most costly. You can obtain a magic lantern for from ten shillings to more than as many pounds. Our correspondent will find the addresses of various manufacturers of lanterns in our advertising pages, and from them he will learn, on application, prices, &c., of a lantern suited to his purposes.

CARLOS.—Your principle difficulties are manifestly due to the use of over-iodized collodion, as indicated both by the superficial character of the image and by the opaque streaks at the bottom of the plate. Add a portion of plain collodion to the sample you have in use. It rarely happens that a commercial sample of collodion requires, or will bear, the addition of more iodide. A warm tone without a toning process, by reflected light, is very difficult to secure in developed collodion prints. Full exposure, and the free use of acetic acid in the developer, aids the production of warm tones. But the use of a toning process is the only trustworthy means of securing a warm colour that we know. A weak solution of sulphide of potassium or ammonium, either alone, or following a slight immersion in a weak solution of bichloride of mercury, will give a warm black. The use of Sello's intensifier will give a brown tone. Short exposure and prolonged development tends to the production of cold black tones, and this tendency is increased by the free use of citric acid.

M. H.—We believe that several of the photo-mechanical processes are worked in Paris. The photo-relief process of Mr. Woodbury is worked extensively by Messrs. Goupil and Co. We do not remember their address, but a letter addressed to them as Art Publishers, Paris, would find them there. Of course you know that the process is in regular operation in this country. The address is 178, Regent Street.

A. W. T.—Your glass plate, from insecure protection against the stamping process in the post office, arrived in fragments, which render a careful examination impossible. We have repeatedly met with minute reticulation of the carbon film, but not often so fine as that in your film, so far as we can judge from the fragments. The chief cause of this we have found to be the use, in development, of water at too high a temperature, especially if the film has been kept sensitive a little time and has been approaching a state of insolubility. Drying the tissue in an atmosphere where gas is burnt will at times cause a tendency to this defect. We are assuming that the reticulation or crappiness of which you complain is similar to that with which we are familiar, the small pieces of the plate not affording us actual certainty.

LEARNER.—We are familiar with the troublesome zigzag markings on the negative. They generally arise in a somewhat old, over-worked bath, but which, in other respects, is working well. A thoroughly good sunning, and careful filtration through cotton-wool, taking care that there is no floating scum on the top of the bath, will often effect a cure. When the bath is emptied to run the solution in an open dish, wash out the bath very thoroughly. We have sometimes known similar markings disappear on removing the solution from a gutta-percha bath to one of glass. 2. We do not know of any better set of account books for a photographer than those issued by Mr. Hooper.

CAPTAIN TUNTON.—The best plan will be to write to the Secretary pointing out the necessities. Such a request would doubtless receive attention. We will do what we can. We shall look with interest for the examples you mention.

W. B. WOODBURY.—The letter was duly forwarded. Several Correspondents in our next.

The Photographic News, October 1, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PASSPORTS AND PHOTOGRAPHY—DRY PLATE MANIPULATIONS.

Passports and Photography.—It is strange that those countries which still believe in the efficacy of passports should not have adopted photography in later years as a means of identification. When camera portraits first became general, it was prognosticated on all hands that they would be largely employed in this way, but beyond the instance of their being used on the occasion of the last Paris International Exhibition, when each season ticket holder was compelled to have a copy of his own portrait pasted across his credentials—which portrait, by the way, was first of all compared and stamped by the officials—there has, we believe, been no special employment of portraiture in this way. In this country we have long ceased to believe in the value of passports, or such like documents, opining, with some truth, that they do quite as much harm as good. If a rogue wants to escape the country, he is pretty sure to pass free, provided he has a passport, and whether the same is forged or stolen, is to him, of course, quite immaterial. It is true that on the Continent they enter a little more into detail of the personage to whom the document belongs, and do not merely, as in the case of our Foreign Office, simply fill up the bearer's name upon a printed sheet, the greater portion of which is devoted to the names and titles of the Foreign Secretary himself. This English custom of ours often misleads, and gives rise sometimes to amusing mistakes on the part of foreign officials whose duty it is to examine them. We remember an instance of this some years ago, before Savoy belonged to France, and when a good deal of smuggling went on with contraband goods, which were first imported, duty free, into Switzerland, and then passed surreptitiously into Savoy and afterwards into France, there being no very strict frontier line between these two countries. Walking over an unfrequented pass into Chamoix (which was then Italian, or Savoy, territory), we were confronted by two *gens d'armes*, who immediately asked for passports. These were produced, and our fierce interrogators looked everywhere for the "means of identification," which, as we have said, it is usual to insert in foreign documents of the kind. One warrior stood ready with note-book and pencil, while the other searched the passports over and over again for the desired information. In default of this, the representatives of the kingdom we were invading, without permitting us to explain matters for one moment, began to copy down the names from the written type at the head of the document, and, finally, they permitted us to depart, the pocket-book bearing a record to the effect that "We, Earl of Clarendon, Baron Hyde, of Hindon, one of Her Majesty's principal Secretaries," &c., had passed that way, going on foot to Chamoix. In a case like this, where uneducated men are entrusted with the inspection of documents, the use of photography would be very welcome, as it would be a means of identification, that could be appreciated even by those who cannot write or read. We are not discussing, of course, whether passports are of any use or not, just now, but showing how, if there are to be passports at all, these may be made more effective by being illustrated with the bearer's portrait. We, personally, have no faith in passports, but that is not to the point. If you do carry a passport, you wish, naturally, that no one who puts a visé upon it, should harbour any doubt that it does not belong to you. And passports, although, generally speaking, but one more vexation to the traveller, are, it must be admitted, of value sometimes, especially those issued by our own Foreign Office. As we

have shown, they are not too inquisitorial in their nature, and they sometimes lead officials, unacquainted with their grand appearance, to think the traveller a man of extraordinary importance. Thus we know of the case of an English gentleman having been admitted to one of the Paris forts, just at the close of the war, by the Prussian commandant for the time being, who had the Englishman's big flimsy passport brought before him, bearing upon the top the Royal Arms, and enjoining all those whom it may concern to permit the bearer to pass "without let or hindrance." In this country we recognise in the passport the only document of a personal character common among us, but abroad, and especially in Austria and some parts of Germany, personal documents, giving minute description of one's age, height, complexion, and birthmarks are very general. All apprentices, servants, and government officials are provided with such documents; and it is here that a photographic portrait would come in most aptly. Such documents as these only find a parallel with us in the ticket-of-leave, for in this country we do not care to register British subjects, unless they come within the reach of the law; to us, therefore, photographic portraits would be of little benefit, but if it is the desire of other countries on the Continent to continue the practice of verifying the person of every stranger that passes, it would be well surely to have recourse to photography as one of the best aids in their power. That a camera picture does not always afford undeniable proof we are perfectly aware, but it gives undoubtedly the best assistance possible under the circumstances. We commend the matter to the consideration of our neighbours.

Dry Plate Manipulations.—Everybody knows that the development of collodio-bromide dry plates may be effectively controlled by increasing or diminishing the amount of ammonia employed in treating them, and in this way plates which have been very much exposed indeed, may be prevented from fogging. Again, most photographers know that while over-exposure may be thus counteracted, plates which have received but a very brief impress by light, and have been exposed for a much less period than should have been the case, never become good negatives, no matter how skilfully they are treated with the developer. Hence, we have learnt always to expose beyond the mark, when dealing with dry plates. In the case of some plates we have recently exposed, we went still further, and took care to give them three or four times the period that was necessary to produce a sufficiently exposed plate under ordinary circumstances. In this way we succeeded in securing visible images upon our plates in almost every instance (we were employing films according to Stuart Wortley's formula), and this result served as a very good guide for development. With a solution of the strength ordinarily used, these plates of course flashed out with unparalleled rapidity, and it needed a rapid action to wash and save the film; but we found that by employing a modified and weaker solution, this acted with the most uniform results, in the case of all plates upon which an image could be seen first of all by reflected light, and before even it had been touched by alcohol. By thus thoroughly over-exposing, we made sure, therefore, of getting favourable results, and we were able to work in all cases with much certainty. The intensity of the film of these plates is a matter also that it is necessary to have some experience of, for it is far greater than one at first sight might imagine to be the case. So deceptive is the film at times, that it is wiser, we hold, always to undertake the operation of intensifying after fixing, for when the plates have dried, a truer estimate of their character may be formed. What to the operator in the dark room appears to be a thin weak film, turns out very often on printing quite intense enough for one's purpose. This is only one more proof that the practice of dry plate photography is a matter not to be learnt in a day.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XIX.

PRINTING—MEDALLIONS AND FANCY PRINTING.

THERE is rather more in printing than the mere placing of negative and sensitized paper in the printing frames, and seeing how many prints you can "knock off" in a day. Study, thought, and no little ingenuity must aid experience, because the qualities of the negatives made necessarily vary very much, and to treat these all alike would result in a plentiful crop of bad prints at the day's end. It is often necessary for the printer to "doctor the negative," even after it has been retouched, one of the gravest faults of retouchers—after their falsification of art—being, that they very often do not understand the printing qualities of the negative. The printer should study each negative before printing it.

In the background often there are streaks and stains that would mar the picture very much if printed out to the size of the card. Sometimes the pencil is powerless to remove these marks, and even the application of Prussian blue fails to blot them out. In this case work up as nicely as possible the portion of the background adjacent to the figure, and vignette. Oftentimes, smoking the front or glass side of the negative over a lamp, and removing the deposit from the face, hands, and the denser stains on the background, &c., may improve the negative; but this method requires considerable care and skill. It is needless to advise you not to print from such a negative if you can get a better with another sitting.

The shadows in photography are generally too strong, and not unfrequently, after the negative has passed through the retoucher's hands, the printer has to resort to his dark pencil and Prussian blue. A frowning expression should generally be considerably modified, especially as the scowl is often not habitual to the sitter, but the effect of too strong light, particularly when the mode of lighting which photographers are pleased to call the "Rembrandt" is adopted.

With a dense negative the shadows are fully printed, without much detail on the light side. The glaring white may be subdued by being exposed to diffused light through a form cut to the shape of the white portion; or the paper may, with many negatives of this class, be first slightly discoloured by exposure to light before printing; but this shading must be done with judgment, or flatness will be the result. Intense negatives are best printed in direct sunlight, because contrast is subdued by the rapid printing. The paper should be silvered to be less sensitive than for the ordinary work, and thus in a measure reduce the contrast. A short floating on a weak bath should be resorted to, and this paper set aside for your intense negatives. Pink tinted paper is also useful, the delicate flesh colour being preferable to the glaring white.

For weak negatives almost the reverse measures advised in the case of intense negatives are resorted to. A lengthened floating of white paper on a strong bath, and an extended time of fuming, and slow printing, are the general rules to be borne in mind. Of this class of negative we may have many only "thin," but otherwise perfect in gradation of light and shadow; and all we have to do is to reduce the rapidity of printing. To accomplish this, we print in deep shade, and under several thicknesses of tissue paper. Coloured glasses may often be interposed between the negative and the light with good effect. A yellow varnish of one part iodine to one thousand parts of negative varnish is to be recommended for thin negatives. But there is another order of weak negatives, utterly flat and uninteresting, the which to see puts you on very bad terms with the operator whose work it is. For such negatives there is required a good deal of skill and patience. Coating the face and hands and lights with Prussian blue, or, in some cases, Naples yellow, retards the printing of these portions. I have also covered negatives with tissue paper, and worked upon it with pencil and colour—but I believe this is now a patent process, though I did it long

before Her Majesty's Commissioners covered it by granting letters patent—and, in some cases, by making little masks of tissue paper, and pasting them on the unvarnished side of the negative, over the face, hands, &c.; this I believe you may still do without fear of consequences.

Drapery very often requires some dodging—a wrinkle in a dress often costing a lady as much trouble as one in the face—and many excellent pictures are disliked and rejected by customers, on account of a fold marring the appearance of the dress. Folds may be softened or obliterated by the retoucher. Lace can be improved by a few judiciously worked-in lights. The appearance of beads and jewellery also may be improved by the same means. A lady's white drapery may, in many cases, be much enriched by a light artistically worked-in along the top and some portion of the sides of the folds, to supply contrast in what might otherwise be a very monotonous effect. Dark drapery should sometimes be printed beyond the time allowed for the whites, those portions being shaded.

The hair should be carefully examined to see that no ugly tufts project beyond the head to spoil the outline; and should such exist they should be carefully worked out, as also straggling hair, &c.

The face.—See that the retoucher has done his work properly, heavy lines softened, proper gradation of light and shade secured, everything as it should be; and having seen that the negative is in proper condition for printing, it is ours to secure the best results, that the prints are bold and brilliant, and yet soft and full of detail.

FILLING THE PRINTING FRAMES.

As it is one of the easiest things in the world to break a negative in the operation of preparing for printing, *care is necessary*, not in this alone, but in all the manipulations, not only of printing, but of photography. The glasses should be all of the proper size; but should one be too large, never attempt to force it into a frame; or should it be in any way small, prepare a bed for it of another plain glass placed first in the frame. Dust should be brushed from the surfaces of the negative with a camel's hair brush before putting it into the frame, and before each piece of paper is placed in contact. When the paper is in position, hold it up to the light and see that it is properly adjusted, not too high nor too low. Should there be any flaw in the paper, place it so that it will come in the drapery or shaded part of the picture, and exercise the same thought where there is a water-mark in the piece of paper. *Such pieces should never be used for vignettes*, for which the very best pieces should be laid aside. Adjust the pads carefully, taking care not to move the paper. Keep the pads free from dust.

VIGNETTING

requires considerable care, and calls for no little taste. The vignetting board or opaque paper in which is cut the form required, is adjusted to the frame by holding it and the negative in the frame up to the light to see that it is properly placed, and moving the vignetter to its proper position. The proper shape for the opening is oval, but this must in some cases be modified to suit the negative. As the light, in printing under the vignette opening, diffuses, it will be found necessary to cut it a little smaller than required in the resulting picture. The opening is covered with tissue paper, and the frame must be placed so that the sun's rays fall perpendicularly on the frame, or, creeping in too much on one side or the other, the print will be uneven. As explained about the frames for this style of printing, the bevel must remove the vignette paper well from the negative to give softness of gradation. The negative, to be printed successfully as a vignette, should be well balanced in the pose of the head and shoulders. The background should be of one tone, and generally lighter than in ordinary portrait work. Should the graduated background or cone have been used, one side being darker than the other, the vignette should be placed nearer that side of the figure, or cause it to print slower (and thus reduce the depth of colour) by adding a darker paper on that side.

A very beautiful and truly artistic effect is produced by shading the white background of the vignette to a grey tint. The author has seen very few specimens of it, so that it may commend itself as a novelty, too often an unworthy quality, but not so in this case. The vignette made, it is placed between two *clean* glasses. Resting on the left hand the print is exposed to light, the figure and shading of the background protected by a piece of oval cardboard a trifle smaller than the picture. The glasses are kept gently turning on the left hand, while the forefinger of the right keeps the cardboard oval in motion, so that sharp lines are prevented. The rotary motion of the print is necessary to prevent the shadow cast by the hand having an influence on the print, and the gentle motion of the cardboard precludes the possibility of sharp lines. These simultaneous motions will prove difficult at first, but by beginning practice in very subdued light, sufficient ease and certainty will be acquired to successfully shade in strong sunlight, and the result will fully repay a rather difficult lesson. *The grey background should never be darker than the shading behind the figure of the original vignette.* The same effect may be produced (but not so perfectly) by exposing the print protected by cotton wool over the printed portion in subdued and diffused light.

PRINTING IN OVAL OR MEDALLION.

The oval forms and cut-outs may be procured at the stockdealers of much better shape than the printer can himself make. This is a very popular form of printing, and by it many pretty effects may be produced. The negative is first printed with the oval shape opening, to the proper depth of tone; the print is then placed on a sheet of glass, face upwards, and the oval cut-out placed in position over the print. It is in my idea better to adjust it a little on one side, whereby a little edge of the print is exposed. A clean glass is now placed over print and oval cut-out, protecting it, and the white margin is slightly discoloured to a grey tint. By this means a fine line of white is seen on the side covered by the oval, and a dark line on the other side where the oval of the print has been exposed a second time, an effect seen in many old oval steel and copper line engravings.

Fancy borders may be made with negatives of fine lines, curves, coarse drawing paper, marbled paper, fancy figuring, &c., in place of the plain glass under which the oval picture was exposed the second time.

The vignette oval is a combination of the vignette and oval—the oval stopping the delicate diffusion of tone to the shape of the opaque form, it may then be delicately shaded as described for ovals.

ARCH-TOP FORMS.

These are cut out by the printer to suit special negatives, or may be procured at the stockdealers. There is scope for a great deal of variety, and they are printed in the same way as the oval forms. Though this fancy printing often adds to the beauty of the picture when taste is exercised, it is very dangerous to the printer to whom taste and propriety are strangers. The designs should never be so glaring as to distract the eye and senses and take the attention from the portrait, nor should they be so complicated as to give the idea of a troublesome Chinese puzzle. Do not strive after a striking effect.

Care should be exercised to preserve the paper and prints from stains and finger marks that are so likely to be communicated to them by a dirty and heedless manipulation. The fingers should be kept free from dust and frequently washed. A coarse towel should be kept handy on which to wipe the hands in warm weather.

THE PRACTICAL PRINTER IN AMERICA.

XL.

PRINTING VIGNETTE PORCELAINS.

For the purpose of printing a vignette porcelain a block is made similar to those which have been described in Part I. The block should have a pasteboard fastened to it,

upon which the clamping springs of the porcelain board can be fastened, which will then, besides keeping the porcelain and the negative in close contact, also hold the vignette-block in its place.

The same attention is required in vignetting porcelains as is necessary in printing positives on paper; so choose a suitable vignette-block, and cover it with tissue-paper before placing the porcelain out to print. In case the background is a poor one it should be taken out, as has been explained, the only difference between the two being, in one the print is on paper, whereas here it is on porcelain. I have very often taken out faulty backgrounds, and have printed in fine ones, and the result has often been very satisfactory to me, for they looked very fine, and also as if it was the original background.

When the high-lights of the face of the printed porcelain are too blanky they should be toned down by exposure to the light for a couple of seconds or so, which is best done by obtaining a suitable piece of a dark or opaque paper, and tearing a piece out of it, leaving a hole which should be full as large as the place to be tinted. Hold it out in the light, and keep the paper in constant motion while there, so that there will not be any harsh edges.

PRINTING MEDALLION PORCELAINS.

Perhaps some of my readers will say that this style of porcelain picture is never printed; but allow me to say to the contrary, for I have very often seen very good results obtained with this style of printing, and which, on account of their novelty, was very pleasing.

When you have an old negative, and there is a porcelain wanted from it, then it can sometimes be printed in a medallion very nicely, especially when the draperies are very black, and the background is also very dark, both of which are very troublesome in vignetting to obtain fine feathering to the halos. These medallion porcelain prints look very pretty when the porcelain to be printed is to be of a small size, as a $\frac{1}{2}$ -size plate, but for anything larger than that size, we do not like them at all.

When the medallion style of porcelain printing is made it should be put up in a square opening, either in the now fashionable gilt case, or in the more sober-looking passe-partout.

To print these porcelains in the medallion style you should follow out all of the particulars that have been fully explained in a chapter devoted to that in Part I, viz., medallion and arch-top printing. Place the right side of the mask (background) at its proper place on the face of the negative, and then place the porcelain out to the diffused rays of the sunlight to print. Now print the crescent line on it, as you would do with a paper print. Do not tint the outside very dark, a neutral shade between the background and the shaded crescent line being about right. In placing the mask on the porcelain to shade the line be very careful that you do not scratch the film, for it is very tender.

WASHING THE PORCELAINS.

The porcelain when printed, and the high-lights tinted a trifle (if they need it), is then ready to be washed and toned, which had better be done as soon as printed.

Take the porcelain and go into the toning-room and arrange the light so that it will not be too strong, and whatever further operations you may do to the porcelain, before you are through with it, should be done away from the window, especially in the toning of it, as will be presently shown. Now take a four-ounce vial, partly filled with good alcohol (not necessarily 95 per cent.), and before you wash the porcelain a particle with water you should flow the contents of this vial over the prints, say half a dozen times, or until the print has turned a beautiful red colour, which it will do in a very few minutes.

In pouring the alcohol on the plate, do not pour it always on one place, but at a different one each time, and be sure that the alcohol flows over all parts of the porcelain plate at the first flow, or else a harsh edge will be the result which sometimes does not disappear in the final washings.

either with the alcohol or the water, although it may be said that this occurs very seldom. Do not keep pouring on the alcohol until the porcelain has turned a yellowish-red colour, for this is very objectionable, and you may set it down as a rule when this colour appears, then the strength of the print is fast disappearing.

When the print has turned a rich and warm colour, which, if it has not been fumed too long, it will do in fifteen to twenty-five seconds, the plate is ready to be washed tolerably well under a tap of rain water.

At first the film will repel the water, owing to its being soaked with alcohol, but in a couple of minutes or so the water will run smoothly over it. In the winter the plate had better be washed with lukewarm (no warmer) water, and never think of such a thing (much less acting upon it) as washing the porcelain with ice-cold water.

In placing the plate under the tap to wash, do not permit too large a stream of water to flow on it, for you must remember that the film will be more likely to slide off the plate if the water should manage to get a little under a corner with a large and heavy stream than it would with a small one. Do not let the water fall all of the time at one place on the plate, but move it so that it will fall at different parts of the plate, and as this washing does not require more than four or five minutes at the most, the beginner had better hold the plate in his hand during the whole time of washing, as the result will probably be better.

A good way to tell when the plate is sufficiently washed is to taste a drop or two of the water which has drained last from the plate, after it is removed from the flow of the pipe, and also after the plate has washed awhile, and if you do not taste any of the silver, you can conclude that the plate is washed plenty.

An acetic acid wash, for the porcelains, is not a very good thing compared with alcohol, as a trial of the two will prove.

TONING THE PORCELAIN.

Make up, while your porcelain is printing, a toning solution as recommended below, so that it will have a chance to ripen before it is required. The toning solution for porcelains, as well as for prints, should have a chance to get ripe before it is used, and it should therefore be made up at least fifteen or twenty minutes before it is wanted. Take a clean six-ounce wide-mouth vial and let fall about fifteen drops of a stock solution of chloride of gold into it, said stock solution being one grain of gold to the ounce of water. Place in it a piece of litmus-paper, which will turn red, and add drop by drop of a saturated solution of bicarbonate of soda to it until the paper will turn a little blue, shaking the bottle in the meantime. Now add about four ounces of filtered rain-water, and shake well.

Cover it up with a piece of glass, and let it stand for about five minutes in the sunlight, and then place it in the toning-room until ready for use. In winter, and often in the summer, it is an excellent plan to slightly warm the toning solution, and allow it to cool to a lukewarm state. The object of this is to make it tone more quickly, and also better than it would with a cold toning solution.

I have advised to make the toning solution in a bottle for the purpose of "toning by hand," but I should advise the beginner to make up the solution in a dish, for instance, a quarter size, and tone in that.

If you tone by hand never pour the solution twice on the same place, but at different places, and these places should be in the shadows, and not in the face, for uneven toning will often be the result, the high-lights and half-tints toning a little quicker where it is poured on a number of times than it does elsewhere; on the whole, it is better not to pour it on the printed picture at all, but on various parts of the margin of the porcelain, providing it can be so done.

In toning the porcelain in a dish, keep it constantly under the surface of the solution, and keep a slight motion to the toning solution constantly. The light for toning is a matter of considerable importance, for this, and this alone is in by far the majority of cases the sole cause of over-toning, because we tone our porcelains to what we think

to be the right tint, toning in a strong light, and consequently when the porcelain is fixed we find that "it is overtoned."

You should tone in a weak light, and only until the high-lights and half-tints of the face commence to look a trifle blue, at which time the porcelain is toned, and the solution is to be washed immediately off.

If you were to examine a porcelain, as toned in a weak light, in a very much stronger one, it will appear to be undertones, but it is not, and the beginner will do well to remember that a porcelain cannot be toned as much as you would a paper print, for it would be very much overtoned.

Considerable experience is required to tone them properly, and "to keep your hand in" you should make them frequently.

PHOTOGRAPHS OF THE ELECTRIC SPARK.*

BY DR. J. SCHNAUSS.

DURING last winter there happened to be, by accident, a powerful frictional electric machine in my laboratory, while I was engaged on an evening in the preparation of dry plates. By way of experiment, in order to learn the action of a positive spark upon a sensitive plate, I allowed the same to act upon a collodion plate which was taken from the bath and not washed. The metal point from which the stream of electricity emanated was rather blunt, and was at a very short distance from the surface of the plate, held in an upright position. It happened, therefore, that beside the electric current a few finer sparks leapt upon the plate, and on development of the film there was to be seen scarcely any action from the current which had proportionately the greatest amount of light, while each of the little imperfect sparks (of reddish-yellow colour) was depicted very beautifully and sharply, like a radiating star. These phenomena interested me very much indeed, and without knowing that I had a predecessor in the experiments, in the person of Prof. Rood, of Troy, New York, who gave an account of a similar investigation in Silliman's Journal, I continued my experiments in various directions, and communicated the results to various physicists of my acquaintance, to whom the subject was new. We were all of us of one mind respecting the analogy of these phenomena with the known Lichtenberg electric figures. The latter are produced by printing a strong electric spark from a Leyden jar to fall upon a resin (or, better still, resin and rubber plate), and rubbing the place over with fine powder, such as earth-moss weeds, which then renders the form visible, the latter varying according as a positive or negative electric discharge has taken place. The powder, in my case, was replaced by the fine particles of silver upon the plate, and it is apparent that the result is less the effect of chemical decomposition than of electric attraction, or, perhaps, even mechanical action, as I hope to prove in the sequel.

I am so far at variance with my predecessor, who sought to show that the result was due to the action of the light of the spark, and it is for this reason that I have been led to publish these remarks. The paper of Prof. Rood I found, after searching many volumes of physical papers, in Poggendorff's Annalen, vol. cxvii. p. 595. In the German photographic literature there seems to have been nothing said on the subject. Prof. Rood employed in his experiments very complicated apparatus, while I made use of a little plate in the form of a strip of glass, simply holding it in my hand, previously wetted, in the vicinity of the point of the conductor, and in this way secured just as perfect pictures, which were so far analogous to Lichtenberg's that the negative plate gave different pictures.

The accompanying illustrations show the positive and negative photo-electric figures on a considerably enlarged scale. The plate around the figures is perfectly clear and transparent, which is already a proof that the markings

are not due to the action of light. Prof. Rood seeks to explain this by saying that the very rapid nature of the spark prevents any action beyond the place where the spark has actually touched the film. Herein, however, lies the proof that the figures are only produced by the immediate contact of the electric spark with the photographic film.

In fig. 1, *a* and *b*, which are pictures of the positive spark,

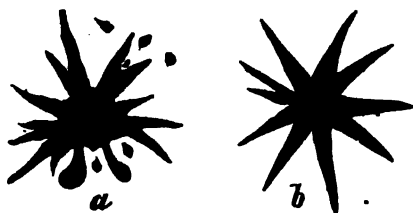


Fig. 1.

it is seen that there has been a simultaneous throwing out of the silver solution from the centre, and this accounts for the radiating form produced. In the case of the negative spark, fig. 2, this peculiarity is not seen, or, at any

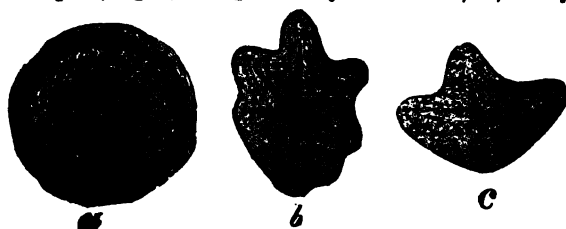


Fig. 2.

rate, it is but slightly shown in *b* and *c*, while *a* is of ring-like shape, with a black centre, and a dark cloudy corona. In the negative figures one particular spark must have acted with exceptional power, therefore. The negative pictures also develop much more faintly than the positive ones.

If, before the development, the exposed plate is examined with a magnifier by transmitted light, holding them against orange-coloured glass, at the back of which a candle burns, there are to be seen small microscopic black points, which have probably been produced on the spark striking the plate, and which appear to form the centre of every picture. If the plate is by accident struck by a current from a positive conductor, a fogging of the plate is seen after development.

Upon ferrotype plates the result from the positive conductor is very beautiful and fine, as the metallic base favours the attraction of the electric current. The natural size of all the figures obtained by me was 0.001 metre in diameter, a dimension which, in comparison to the almost unmeasurable minute thickness of the fine electric spark, appears considerable.

Starting with the assumption that only a mechanical action, or spiriting out of the silver solution, is the cause of the whole phenomenon, I was of opinion that the silver solution alone would be sufficient to bring out the figures. To test this, I took a strip of glass covered with uniodized collodion, and, having dipped it into the silver bath, proceeded as before. After development there appeared a mass of stars, which, if somewhat paler, were of the same character as when iodide was present. The same result, I found later, Prof. Rood had also secured, and it is to me therefore, inexplicable, how he could imagine that the phenomena were due solely to the action of light.

In order to clear up more perfectly the cause of these figures, I tried in the first place to ascertain the action of frictional electricity (without emitting sparks) upon iodide and nitrate of silver. I employed a mixture of these substances with the ordinary developer, and discovered that a

hundred seconds, in a dark room, was insufficient to bring about decomposition. The mixture was put into a thin dial glass, and the latter placed upon a brass plate in connection with earth, and, by means of a platinum wire connected for more than a minute with the positive pole of the machine. No decomposition was, however, brought about, and the result was the same when a spark was allowed to leap over the fluid. The iodide of silver remained perfectly unchanged, there being only separated from time to time glittering metal particles of silver reduced by means of iron vitriol.

In perfect unison with my theory did sensitive dry plates behave. I employed for the purpose very sensitive bromide of silver plates, as also morphine and albumen plates. Little sparks produced no result at all, and only powerful sparks from a Leyden jar gave rise to a bronzing of the place where contact was made. In the same way behaved a moist iodide of silver collodion plate from which the nitrate of silver had been wiped off, for no result was secured; if, on the contrary, the plate was washed after the spark had struck it, and then dipped in the silver bath again and developed, the figures were to be seen most perfectly.

I prepared some collodion with different finely-suspended precipitates which are indifferent to nitrate of silver, such as sulphate of barium and sulphate of lead, which were substituted by way of experiment for the bromo-iodide film; the plates prepared with these salts were dipped in the silver bath, after they had been washed with water and freed from all the soluble by-products emanating from the double decomposition. After exposure to the electric current, the developer brought out the same beautiful figures as they appeared on a bromo-iodide film, a further proof, therefore, that it is not a question of the action of light at all. The plates produced with sulphate of lead could be fixed in the ordinary way with hyposulphite of soda.

It appears from this, therefore, that we have here the electric spark acting in a mechanical manner and producing upon a film saturated with nitrate of silver (for bromo-iodide of silver, we have seen, is altogether unnecessary, and, at the most, blackens the image) exactly the same effect as a short exposure to light, the result being a so-called latent image, made visible on development. Is it possible that this phenomenon is an important indication as to what the explanation of the theory of the latent image may be?

The following control experiments which I made may be mentioned. A sheet of paper saturated, as in the case of the calotype process, was placed upon a metal plate, and powerful electric currents were then allowed to pass from a Leyden jar to certain portions of it. Fine holes were in this way produced, but it was only when put into a gallic acid bath that any visible result was perceived, and this was certainly the result of light. A round dark patch was produced, becoming lighter from the centre, but in no way resembling the figures here given.

I have very frequently photographed the electric spark, of course only in profile. The spark from a Leyden jar only gives a vague, though somewhat broad picture; sharper is an image from the spark of a conductor. Electric figures have been observed and described by Priestley and Lichtenberg, and more lately by Grove and Bliss, as also by Pezold and Blake. In the three-volume, and very complete, work of Riess upon Frictional Electricity, continued to the year 1866, there is, however, nothing about photo-electric figures. Professor Rood's experiments, which were undertaken merely with wet plates, took place in 1862.

The statement of Prof. Rood (and the principal proof he adduces, that the phenomena are due to the action of light), to the effect that a photographic film covered with thin glass or mica, if exposed to the action of an electric spark, still shows pictures of this star-like character, was not borne out by the experiments I instituted.

The Photographic News.

Vol. XIX. No. 891.—OCTOBER 1, 1875.

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THE PHOTOGRAPHIC EXHIBITION.

THE Annual Exhibition of the Photographic Society was opened, in the Gallery of the Society of Painters in Water Colours, in Pall Mall East, on the evening of Tuesday, the 28th ultimo. The room is an admirable one, and the hanging is very effectively, and, so far as we have seen, very judiciously, managed. The background of maroon cloth with which this gallery is provided is marvellously beneficial in giving beauty, comfort, and warmth to the general effect, and there is sufficient design and compactness in the general arrangement of the frames to give the walls a furnished appearance in place of the scattered, irregular, and repelling effect we have seen where the pictures were hung, almost at random, against a bare wall. There are some very fine pictures at the present exhibition, and the general average of excellence is high. The chief drawback felt is a consciousness, after examining the whole, that the examples of really great work are so very few, and that there is absolutely nothing new—nothing which makes any definite step in advance of former years, either in the capacity of the art or the status of the exhibition; and whilst in average excellence there is no advance, in numbers there is a marked falling off. Two years ago, the number exceeded those of the present year by about fifty contributors and a hundred contributions. Last year showed a considerable falling off, and this year there is a still further diminution in contributors and pictures, in the former especially, as about one-half of the total contributions are sent in by a score of contributors. Many distinguished names, always associated with pictures well worth attention, are conspicuous by their absence from the present catalogue. We miss the names and work of Robinson and Cherrill, and Earl, and Col. Wortley, and Frank Good, and Abel Lewis, and Marshall Wane, and Jabez and Alfred Hughes, and William Mayland, and Manners Gordon, and F. Hudson, and H. Baden Fritchard with his Woolwich staff, and B. J. Edwards, and Baynham Jones, almost all the contributors to the Crawshaw competition, and a host of others. With the exception of landscapes with supplementary skies, there is scarcely any examples of combination printing, and very few attempts at essentially pictorial photography.

The most striking feature on entering the room is the prevalence of large work, the bulk of which is, of course, enlargements. Messrs. Spencer, Sawyer, and Bird, contribute not less than five-and-twenty large frames, chiefly carbon enlargements, all fairly maintaining that high standard of excellence which their last year's work possessed, and beyond which it would scarcely seem possible to pass. The Woodbury Printing Company send a large number of frames of precisely similar work, not inferior in excellence. Mons. Lambert contributes several enlarge-

ments, and Mr. Croughton sends some fine examples. Mr. Crawshaw sends some admirable examples of life-size portraiture, taken direct, without enlargement, and Mr. Gillard, of Gloucester, has some capital examples in the same style; and very fine specimens of large, but not life-size, direct portraiture, are exhibited by several contributors, notably a magnificent head of Salvini, the great Italian tragedian, by Mr. Blanchard. One of the most important and novel effects in portraiture consists of a group by Mr. Slingsby, of Lincoln, of singular excellence. It is a large picture about twenty-four by eighteen inches, so far as we can judge, not having measured it. The group consists of two ladies, one sitting and one standing, beside the fire in a comfortable and elegant sitting-room. The interior and the figures, and the relation of each to each, the quiet, satisfactory harmony of the general effect, the sense of unconscious comfort, are singularly satisfactory. They are charming looking ladies at home in a pleasant room, not simply figures introduced amongst accessories with which they are unfamiliar, and do not pictorially harmonize. This picture is not produced by combination printing, but is obtained by one exposure on one plate, and is a marvel of technical excellence as well as artistic beauty.

Probably the most charming pictures in the Exhibition are a couple of portrait studies, by Mr. R. Faulkner. These are on opal plates, about twelve by ten inches, produced by the carbon process, patented by Mr. Window a few years ago, a powder process analogous to that which has been recently employed to reproduce negatives. Mr. Faulkner states that he finds that, by availing himself of the control over the character of the picture which is left in the hands of the manipulator during the process of developing, or bringing out the design, by applying a carbon powder, he can produce an image exactly adapted to the production of a picture, which can, by judicious finish, be made a work of fine art. The two examples to which we refer admirably illustrate the position. They are two studies of a pretty little girl in the quaint, old-fashioned costume with which many readers will be familiar, in the most charming child pictures ever painted—those by Sir Joshua Reynolds. One of these is entitled "Simplicity," in humble imitation of the picture with that title painted by Sir Joshua. Apart from the winsome, unconscious simplicity of the little model, the treatment here is in every way delicious. Of course, pose, expression, and style generally follow the prototype as nearly as possible; but the management of light and shade, the tender gradations of flesh and draperies are singularly beautiful. The companion-picture, a portrait of "Dorothy Morrison," the same little sitter, is scarcely less charming. A frame of studies of children (323) produced by the same process, but left more in the state of sketches than finished pictures, are in every way delightful, the young models full of baby beauty, and the treatment admirable. A frame of enamels by Mr. Faulkner, the only examples of this kind of portraiture, we believe, in the room, contains some specimens simply perfect.

The landscape contributions include many fine pictures. For delicacy and a sense of high finish, Mr. William Bedford remains unsurpassed. Messrs. A. and J. Boal send some large landscapes of very high pictorial value. Mr. Crawshaw, whose name has hitherto been associated chiefly with portraiture, sends some landscapes as full of artistic beauty as technical excellence. Captain Abney's Egyptian scenes possess a curious charm with which we have rarely met in eastern pictures: they suggest all the brilliant glare of light, but are, at the same time, exquisitely soft and delicate, full of a glorious transparency in the shadows, instead of the black patches which have usually been the photographic representation of shadow in such pictures. The staff of Engineer photographers under Captain Abney's charge at Chatham, send some magnificent landscapes. The studies of old English homes, by Mr. Stephen Thompson, are capital. Mr. William Brooks has some

very delightful landscapes; as have also Mr. W. G. Hunter, Mr. G. W. Wilson, Mr. Reuben Mitchell, and others to whom we shall have to return in subsequent detailed notices.

There is not much special pictorial work, although many of the contributions possess high pictorial qualities. Mr. Frank Sutcliffe's work takes high rank in this direction, and Mr. Hollyer sends good work of the same kind. Captain Turton, Mr. J. M. Young, Mr. H. G. Cocking, Mr. Neabitt, and some others send studies to which we shall return. There is little in the way of illustrations of special processes. Carbon prints of great excellence are shown, as we have said, by the Autotype Company, by Mons. Lambert, by the Woodbury Printing Company, and some others, and some admirable examples of photo-mechanical printing are shown by the latter. Pictures from emulsion negatives are plentiful; but, in the majority of instances, fail to do the method justice. Mr. H. Cooper shows some most charming examples, it is true; but the examples sent by Mr. Mawdaley scarcely do him or his process justice, as we have seen better examples of his work. The same remark is true of Mr. Stillman's contributions. The example of gelatine emulsion are few, but on the whole satisfactory, some enlargements from gelatine pellicle negatives sent by Mr. Penny are very good. Some large pictures, apparently collodion enlargements on glass, sent by Mr. McLiesh, are very fine. Captain Turton sends some excellent ferrotype portraits. Some applications of photography applied to the decoration of porcelain, sent in by Copeland and Son, containing photographic portraits burnt in, of a bright magenta tint, are interesting; but the tint is scarcely suitable for the work.

We are unable to enter into detailed criticism of any of the contributions at present, but simply place before our readers a general impression gained during our first visit. More detailed criticism of the most noticeable work in subsequent numbers.

RENDERING BROMIDE OF SILVER SENSITIVE TO THE NON-ACTINIC RAYS.

A FURTHER communication from Captain Waterhouse informs us that he is continuing his experiments with stained bromide of silver films, and hopes to verify the correctness of Dr. Vogel's theory, and also to ascertain how far it can be turned to practical account. In the meantime he is anxious to avoid arriving at a hasty conclusion, and, in a note which we append, he qualifies his former remarks by reaffirming the facts, but guarding against the positive acceptance as yet of any definite theory deduced from them. That the dyes have an effect in rendering the bromide film more sensitive to the red rays, he says, there cannot be a doubt; but he does not find the absorptive action of different dyes so distinct as Dr. Vogel has described—plates, for instance, stained with blue and with orange having given him almost identical spectra. Much further experiment it is probable will be necessary to ascertain all the conditions affecting the results. We now append an extract from Captain Waterhouse's letter:—

"Since writing to you on the 17th, it has occurred to me that in the hurry of writing to catch the mail I expressed myself rather more positively than I intended when writing the latter part of the sentence, 'There can therefore, I think, be no doubt of the action of the dye, and that Dr. Vogel is correct in his theory.' Of the action of the dye I have no doubt, but I cannot pretend to have proved the truth of Dr. Vogel's theory from a single trial.

Later experiments appear to show that, although several of the aniline dyes undoubtedly have an influence in increasing the sensibility of bromide of silver for the less refrangible rays of the spectrum, the absorptive effects of different dyes are not so distinctly marked as the results obtained by Dr. Vogel had led me to expect. I must, therefore, reserve any opinion as to the correctness of Dr. Vogel's theory till further experiments have given me a fuller insight into the subject.—Yours truly,

"J. WATERHOUSE."

PHOTO-BLOCK PRINTING.

WE have repeatedly expressed surprise and regret that the production of photo-engraved blocks for use in conjunction with ordinary letterpress or type printing, had not been introduced in this country to any important extent, or on a commercial scale. Such an application of photo-engraving to supply the place of wood blocks produced by the wood engraver, would, if it proved efficient, be almost invaluable, and would probably find a larger field of usefulness than any other process of photo-mechanical printing. Many such processes have been devised; some have been freely published; some have been patented, and others have been preserved secret. We have seen many admirable results; but, from causes, some of which are not easy to explain, none, as yet, has taken a place in regular practice or become a commercial success. In America, we have reason to believe, as we have on a former occasion intimated, a method of producing such blocks is in successful commercial operation; the company engaged in working it has at the present time, as we learn from the *Scientific American*, sixty persons constantly employed, and these are, it is stated, producing an amount of work which would require for its accomplishment a thousand skillful wood engravers. We reproduce from the pages of our contemporary a few details of the method, and of the early struggles of its introducer, Mr. J. C. Moss, which will interest our readers. After a brief glance of the history of photo engraving, our contemporary says

"Among various inventors in this field, John C. Moss, superintendent of the Photo-Engraving Company, of this city, seems to have achieved the highest success. Being both a practical photographer and a printer, his experience gave him great advantage in his endeavours to prepare plates, by means of photography, to be used on the ordinary type press. He commenced his experiments with great enthusiasm in the spring of 1838; but it was not till ten years later that he had so far succeeded as to get his process into practice, and attracted so much attention that he was induced to unite with others in the organization of a company for the purpose of carrying on the work upon a large scale. Accordingly, the Actinic Engraving Company was formed. But this did not prove a financial success; and after a year and a half it was abandoned.

"There are some inventions which, though of great value, are slow in winning their way to public favour. This proved to be one of them. There existed in the minds of many publishers a strong prejudice against process engraving, due to the fact that several processes had been introduced, of which they had made trial with very unsatisfactory results. Time was required to prove that Moss' process was not like the others.

"Another and perhaps greater obstacle was met in the reluctance of artists to adapt their style of drawing to the requirements of this new art. They had been accustomed to make their drawings with pencil and brush, often hastily, leaving the work to be perfected and finished by the slow and tedious toil of the wood engraver. Now they were asked to furnish pen and ink drawings, executed with the care and exactness necessary to secure the desired result. Their first attempts were generally failures, increasing the indisposition to change.

"But Mr. Moss had pursued his invention too long to be disheartened by these obstacles and delays. A new organization—the Photo Engraving Company—was formed, something more than three years ago. Expensive apparatus and machinery have been introduced, important parts of which have been invented and constructed expressly for this use; workmen have been carefully trained to perform their respective parts; a corps of artists, patiently instructed, have become skilful in the style of drawing required by this method of engraving; and the process itself has, in several respects, been essentially changed and improved.

"One of the methods devised by Mr. Moss to save labour in the production of pen drawings is this: the copy from which a drawing is to be made is photographed double the size of the plate required, on arrowroot paper, and then fixed and well washed, but not toned. Directly upon this print the drawing is made with a pen and india ink. When the outlines and all the important parts of the drawing are complete, a saturated solution of corrosive sublimate in alcohol is flowed over the drawing, which bleaches away the photographic colour without at all injuring the lines in ink. The finishing touches are then added, when the drawing is ready to be reduced and engraved. Thus the tedious operations of sketching and tracing are obviated, and a degree of accuracy is secured which it would be difficult to obtain by any other means.

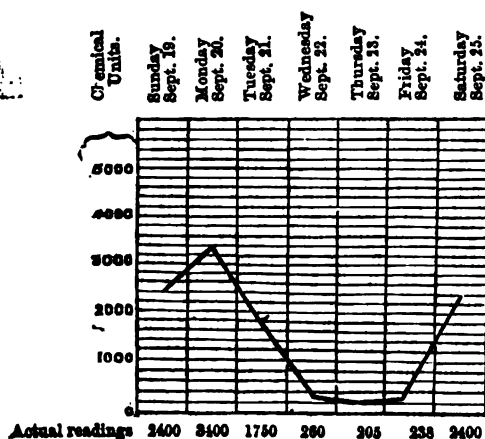
"It should be observed here, however, that drawings are not required for all the engraving done by this company, since a large part of their work consists in the direct reproduction of woodcut, lithographic, and steel plate prints, either of the same size as the originals, or of reduced or enlarged sizes.

"Up to the present time this company has engraved over 50,000 relief plates, measuring over 500,000 square inches; and it is estimated that, with about sixty employees, they are annually performing an amount of work that would require for its accomplishment at least 1,000 skilful wood engravers."

METEOROLOGICAL REPORT OF THE AGGREGATE OF CHEMICAL FORCE IN THE DAY-LIGHT OF THE SOUTHERN SKY, THE OBSERVATIONS BEING MADE AT BLACKPOOL, LANCASHIRE.

BY D. WINSTANLEY, F.R.A.S.

THE appended report is for the week ending Saturday, September 25th. It will be seen that the lightest day of the week was Monday, when the aggregate of chemical light reached 8400 units. The darkest day was Thursday, when it fell to 205, an amount lower than any I have recorded during the past four weeks. The daily average of the week was 1522 units, or 1178 units less than the daily average of the preceding week. For further information the reader is referred to preceding numbers of the PHOTOGRAPHIC NEWS.



THE SPECTROGRAPH:

A NEW AND EXCEEDINGLY SIMPLE APPARATUS FOR SPECTRUM PHOTOGRAPHY.

BY PROF. H. VOGEL.*

In the spectrum experiments which I have conducted during the last two years, and by means of which I have secured several not uninteresting results, I employed a

somewhat complicated and costly kind of apparatus. In the first place, there was a heliostat to throw the sun's rays always upon the same spot; then a spectrum apparatus; and, further, a camera with stand and everything relating thereto. This rather costly trinity of instruments is only at the disposal of a few, and I myself had to borrow to complete my apparatus. For this reason it is impossible for many who take an interest in the matter to conduct experiments of the nature I refer to.

Recently I have constructed an apparatus which can scarcely be imagined in any simpler form, and which renders the expensive heliostat altogether unnecessary. The spectrum apparatus required is that of the cheapest and simplest form: namely, a pocket spectroscop of Browning (mine being constructed by Schmidt and Haensch, of Berlin), and there is, finally, a small camera necessary.

In case one has the latter already in one's possession, it is only necessary to obtain a pocket spectroscop, and fix this, in a light-proof manner, by means of a perforated cork, into the front of the camera. The spectrum lines are then sharply focussed on the ground glass, no lens being necessary in the camera. In order to admit of the entrance of the tube into the cork, the front part of the instrument (the slit tube) is removed, and the back part having been pushed through the perforation, the front portion is again adjusted. I have here a sketch of such a camera with the pocket spectroscop properly fixed (see fig. 1).

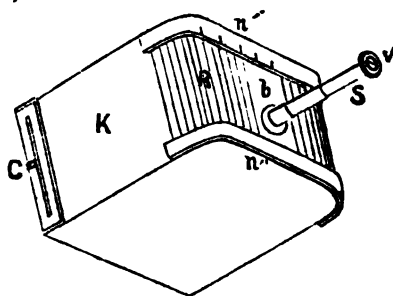


Fig. 1.

The focussing sharply is not an easy matter; to do it, the ground glass must be thoroughly rubbed with oil, and then the seven coloured bands are at once seen. These appear at their best when sunlight is thrown upon the slit by means of a mirror; but care must be taken that the light falls exactly in the direction of the tube. To effect this, the camera is so placed that the spectroscop tube does not throw any shadow, or does so equally in all directions. The front part of the spectrum is pushed backwards and forwards, whilst the sunlight falls upon the slit, until the margins of the colour lines appear perfectly sharp (see fig. 2). Afterwards some of the lines are easily



Fig. 2.

recognised—as, for instance, F in light blue, and G in dark blue; with a magnifier, also, E and b in green may be seen, if only the slit is narrow enough; for the latter may be enlarged or diminished by simply turning the head of the spectroscop.

The point is next sought, by moving the slit-tube to and fro, where E and b appear sharpest (b is then seen double); this is soon done after a little practice. When the sharpest point has been secured, the length to which the instrument has been drawn out is marked upon the tube as a guide hereafter for focussing the spectrum.* If one is at all in

* I may here remark that manipulating the camera will not help in focussing; the farther it is pulled out, the bigger does the spectrum become, without its sharpness being materially altered.

doubt about the sharpness of focus, a trial plate should be taken.

In exposing a plate in the camera, the former, is the dark slide, is pushed into the camera, and this is then taken on one's lap into the sunshine, and held in such a way that the tube is directly in the path of the sun's rays, and does not throw a shadow in any direction. In from ten to sixty seconds a spectrum image may thus be obtained showing all the lines. The latter may not be quite so sharp as those rendered with more complicated instruments, but it is quite suitable for experiments of this kind. If ordinary wet plates are exposed in the apparatus, a very beautiful picture is obtained of lines F and G in blue, and H in violet, and of the ultra-violet; with a long exposure, the lines E b in green are also rendered.

This simple arrangement, which only necessitates an outlay of about two guineas for a spectroscope, I have found so serviceable during the past few weeks, that I can recommend it to all who are under the mistaken impression that spectrum experiments do not need a spectroscope but may be undertaken with the aid of coloured glass.

When I decided upon my recent journey to India, I resolved to perfect this instrument somewhat, so that it could be used whilst travelling; and I employed it on board ship, where I was enabled to secure several spectrum pictures on one plate. To do this, a movable slide was too complicated, and, besides, it rendered the camera more bulky. So I used a camera made on purpose for me by M. Stegemann, which took up very little room indeed. It has no movable slide, but a simple stationary one for plates eleven by eight centimetres. As may be seen from the drawing of it, there are movable shutters *n'* and *n''* which serve to shift the spectroscope, measurements being marked above at *n'*.

The shutters are shifted so that the spectroscope correspond with the marks one after the other, and in this way five spectrum pictures may be secured one after another upon the plate, each image measuring 4 to 4.5 centimetres in length, and 1.2 centimetres in breadth.

The camera is eighteen centimetres long, ten centimetres high, and thirteen broad. By means of tinted dry plates I took, at different times in the day, but giving the same amount of exposure, several images of the spectrum in the Red Sea and Indian Ocean, and obtained some astonishing results of the chemical action upon the various coloured films. A little box beside the camera and dry plates contained the necessary chemicals for the alkaline development of the images, together with four dark slides. The development of the plates was undertaken on an evening in the cabin. I may mention that this little apparatus stood me in very good stead, and withstood perfectly the effects of the tropics. To those, therefore, who do not mind the expense of a second camera, I can warmly recommend this apparatus.

The slit of the ordinary spectroscope has parallel margins. I have, nevertheless, employed a wedge-shaped slit with great advantage. Such an opening yields a spectrum which has one edge dark, and on the other light, and when such a spectrum impinges on the plate, the lighter portion acts at first, and then the darker portion, according to the chemical intensity of the particular colours. From the continuation of the action in the direction of the spectrum lines, a conclusion may be drawn as to the chemical intensity of the colours.

I have called this apparatus the little Spectrograph, in contradistinction to the big spectrograph, which I will describe by-and-bye, and which is far more complicated. The latter is for the depiction of larger spectrum images.

CONTRIBUTIONS TO MEDICO-PHOTOGRAPHY

BY DR. S. T. STEIN, OF FRANKFORT-ON-MAINE.*

I.—PHOTOGRAPHING THE BEATING OF THE PULSE.

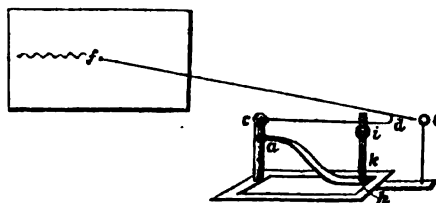
In the same way as photography has secured to us many

pictures of anatomical interest from dead subjects, so I have made use of the art in photographing things of physiological interest from living beings, securing certain actions in life and holding them fast in pictures. The streams of earth magnetism and the variations of the barometer and thermometer have been fixed by means of light curves, and we are similarly in a position to depict, by means of photography, the action of the heart and the beating of the pulse.

The pulse, which serves medical men generally as a tell-tale of health or sickness, can be observed either by hearing, feeling, or seeing. The audible pulse is produced simply by a repetition, or carrying forward of the heart-tones, and is, at a little distance from the heart, inaudible, except in the case of certain sickly patients, while it is well known that the action of the heart itself may be heard very perfectly through a stethoscope properly adjusted. By means of the hand, pulsations may be felt in many parts of the body, the throbbing of the arteries being very marked. As regards the eye, too, a very simple experiment shows how well pulse action can be seen. When any one allows the hollow of one knee to rest upon the other, the upturned toes shows very visibly, by its movements, the action of the pulse; in this way the rapidity of one's pulse may be counted by the eye.

In the different intervals between the repeated blood-wave in the elastic tube of the artery, the walls of the latter are, to a certain extent, stretched out and contracted with every beat of the pulse. The shaking thus engendered, which we term the beating of the pulse, may, by means of a specially constructed apparatus called a sphygmograph, be registered in the form of a curve. The first who essayed in this way to write down the beating of the pulse was the physiologist, Carl Vierordt, of Tübingen. He also constructed a registering apparatus for showing the rapidity with which blood moves through the body, and this he called a Hämotachometer.

A very ingenious apparatus for registering the beating of the pulse was afterwards constructed by Marey, of Paris, the invention being based upon that of Vierordt. The Marey Sphygmograph (of which we give a sketch), consists of a feel-lever in connection with a marker, which registers the pulse curve upon a moving strip of paper.

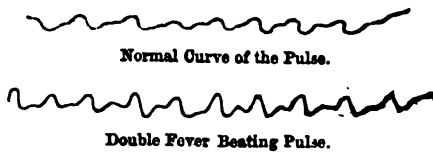


Marey's Sphygmograph.

The spring, *a h*, lies upon the pulse at *h*, and is lifted in the slightest degree at every motion of the pulse. A screw, *i k*, is in connection with the spring *h*, and goes through the lever, which finds a resting-point at *c*, and through a screw socket at *i*, by means of which the screws *i k* can be raised or lowered at will. This lever carries at *d* a knife-edge, bent upwards, and touches a second lever, *e f*, which has its resting-point at *e*, and which moves with great ease up and down. The screw *i k* is close beside this second lever. If, now, there is the slightest movement at *h*, this is imparted at once to the double lever *c d, e f*, and is increased very much at the end of the lever at *f*. The disk which carries the strip of paper in the Marey instrument is set in motion by clockwork, and travels from right to left. When the fine writing apparatus at the end of the lever *e f* rests upon the paper, and the spring *a h* is not in contact with the pulse, the result is a long line on the strip of paper; as soon, however, as *a h* is brought into contact with the pulse, and the levers are set in action, there is formed at *f* a curved line, or, rather, series

* Photographische Mittheilungen.

of curves. Here are two examples of pulse curves as shown by the Marey instrument



Normal Curve of the Pulse.

Double Fever Beating Pulse.

The unavoidable friction which, of necessity, accompanies the pen or other writing instrument robs the curves obtained in this way of a great portion of their scientific value, and for this reason, too, the curves obtained by different instruments vary from one another. No definite conclusion can therefore be derived from the results obtained. Absolute certainty could only be ensured in the presence of an imponderable feel-lever, which could register without friction, and be without action upon the pulsating artery. Czermak believed that he had found a solution to the problem by employing light rays in lieu of the feel-lever. Rays of light are, of course, imponderable; they write instantaneously and without friction by the aid of photography, and they are, to Czermak's thinking, also as applicable as the feel-lever, without in any way altering the natural character of the pulsations. Czermak proposes to focus the light rays by means of a convex lens, and to allow them to pass over a knob or button placed upon the artery. The shadows which this button would throw upon an enlarged scale on a wall opposite, due to the divergence of the light rays, would give, by reason of the rising and falling of the button, a marked curve upon a moving sensitive photographic plate. Czermak worked out this idea, and elaborated a so-called pulse-mirror.

This pulse-mirror is a small thin plane mirror, which is so fitted to the artery that the movements of the latter follow each other with much precision. Concentrated rays of the sun, or beams of artificial light, if strong enough, reflected at a certain angle upon this instrument on the pulse, project a picture on a wall, or screen, that may be seen by an observer or secured by means of a photographic apparatus. Every motion of the artery wall is reflected by the plane-mirror, and is repeated upon an enlarged scale. In order to secure analogous pulse-curves to those of the Vierordt-Marey instrument, by this simple motion of a vertical line, Czermak has caught up the light image coming from the pulse-mirror upon a second mirror, which turns upon a vertical axis with uniform rapidity, and this second mirror it is that throws the picture upon the wall opposite. A light image of this nature moves from one end of the wall to the other in a horizontal direction at every pulsation or curve. Although Czermak believes it to be the best plan to press the pulse-mirror against the artery with the finger, he has contrived a special appliance for the purpose.

These arrangements permit the exhibition in a lecture-room, or elsewhere, to a large audience, of the action of the pulse-wave, as the image may be thrown upon a wall in full sight of the spectators. For photographic purposes, however, the *modus operandi* seems to us scarcely practicable, as on the one hand the reflected movements have far too large dimensions, and on the other the mechanical arrangement of the pulse-mirror, or the use of the finger, must have some injurious influence upon the formation of the curves. Moreover, Czermak, to our knowledge, has not worked out the matter from a photographic point of view, and has not made full application of the imponderable character of the light rays employed.

(To be concluded.)

"PHOTORAMA."

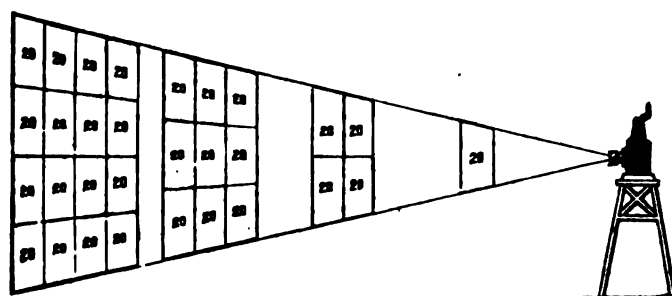
Mr. EDWARD Y. POOLE communicates the following interesting remarks on the value of different modes of illumination for the magic lantern to the *English Mechanic*.

"Now that the long winter evenings are coming, it may be of some interest to discuss a 'recreative science' which has contributed, and by the aid of advancing science will continue to contribute, a great deal of pleasure, information, and instruction to persons of every age and distinction. I once thought whether or not the word 'photorama' would apply to the entertainment produced by the instrument now so popular, but the terms 'magic lantern' and 'dissolving views' seem to hold their place with many for the present.

"Photography is doing a great thing for the lantern, and the painter's art, in artistic hands, will do much to give reality to the effect, providing a pleasing study of light and shade is made by the photographer, and heavy black masses of shadow and high lights, free from half tones, are avoided. But to give effect and do justice to the pictures, in addition to perfect lenses giving a sharp field, we require a brilliant light. For public entertainments on a large scale, of course the oxyhydrogen jet is quite up to the mark, and, for smaller public entertainments, the blow-through jet and oxycalcium spirit lamp may answer the purpose; but for private and many other entertainments, and class lectures, the preparation and cost is too much for the oxygen gas. Ordinary gas can seldom be got to burn above 17-candle power, unless any improvement can be made in burners and gas. The ordinary fountain solar lamp, supplied with 3½ in. condensers, gives, with sperm oil, a 20-candle-power light, or thereabouts, burning about a half-pint in two hours. But, for brilliancy and economy, there is not the slightest doubt that best petroleum will carry the palm with good burners. I have used a tablespoonful of petroleum with sperm oil, in place of camphor, in the ordinary solar lamp, with some advantage. The wick of the solar lamp is very troublesome to put on, and sperm and colza oil are disagreeably greasy liquids to deal with; therefore I think petroleum, alone of the oils, should be studied as a means of illumination, but, from its rapid vapourising properties, the cistern should be placed at the back of the lantern, to prevent the burner being overcharged with gas from heating. The liquid will also have to be kept lower in the wick-case than in the solar lamp. My idea is, that the wick-case can be carried, i.e. fixed, upon a tray with a brass pipe leading from the cistern (which is placed at the back like an oxycalcium spirit lamp and of similar fountain form), the pipe also protected by tin above, forming an air channel round it and the lower part of the wick-case, to prevent heating. The oil would then be only vapourised at the burner. Now we want the burner constructed upon the very best principles—to give intense illuminative brightness and whiteness to the light. Several flat burners with air currents between them burning parallel and as near together as requisite, would do this, but not with their edges to the condensers, or bars of shade will be the result. The 'Silber' light, no doubt, gives good illumination, but we must have more than twenty or twenty-five candle power. The 1½ burner is said to give a light of fifty candles, but whether it is brought into use or not I don't know. My impression is, that in place of the deflecting tube in the middle, a second wick may take its place, and thereby, without increasing the size of flame, we may have increased candle power, probably eighty to one hundred.

Many tyros think that the disc may be increased to any size with the same light, and are disappointed at the rapid decrease of brightness and definition in the picture; but the square set area of the disc will soon explain this. Many opticians deceive in this respect, stating that with the solar lamp a disc of ten to twelve feet in diameter may be produced; but the fact is, that, to get a bright picture, six feet is the limit. A Birmingham firm has been very candid in stating the latter. A diameter of five feet, with a twenty candle lamp, will be as bright as a twenty feet disc with oxyhydrogen light: and, starting upon that

basis, I append a diagram showing the illuminative power required for different size discs. It is shown by the square of the sheet for better calculation.



Dist. 40ft. Diam. 20ft. Candles 320. Area of sheet 400 ft. Dist. 30ft. Diam. 15ft. Candles 180. Area of sheet 225 ft. Dist. 20ft. Diam. 10ft. Candles 80. Area of sheet 100 ft. Dist. 10ft. Diam. 5ft. Candles 20. Area of sheet 25 ft. (Distance depends upon focal of lenses, but the above distances are only ratios.)

times sixteen times the power of light, and so on in proportion.

Correspondence.

"EVENING DRESS" AT THE OPENING OF THE EXHIBITION.

DEAR SIR,—This evening the exhibition of the Photographic Society of Great Britain opens with what is misnamed a *conversazione*, and the "president and council request that all will appear in evening dress." I, for one—and I know that many others—will not attend, because I, and they decline to descend to the donning of swallow-tailed coats for gentlemen, and semi-indecent dresses for ladies, and ape the follies of those who consider themselves the upper classes. I think that I may safely state that every member of the Society, as well as his wife, possesses the good sense and taste to dress decently and becomingly, without being dictated to by the "president and council," to attend what is nothing more than the *private view* of the Photographic Exhibition, and the "president and council" should have trusted to that, and not have printed on the face of their cards of invitation what will be to many a prohibitory condition. As it is, many members—and probably exhibitors—will certainly absent themselves from the *private view of their own exhibition*, solely on account of the *evening dress fiasco*; and I beg to put on record my personal protest against the repetition of such a request being issued by the "president and council" of the Photographic Society of Great Britain. I remain your's truly, J. WERR.

11a, Berners Street, W., September 28th.

[Unhappily, the protest comes too late; this was inevitable, as the intimation that "evening dress" was requested, was not made public until the cards were issued a few days before the exhibition, and being an innovation no one could have anticipated the change. We think with our correspondent it is a mistake. When the present series of exhibitions was commenced, the opening night was styled an exhibition meeting, to which members could invite their friends to see the pictures. The first experiment was such a success that it was resolved to repeat it, and an informal reunion of members and their friends became the established inauguration of each year's exhibition. More than once, in the earlier years, the idea of converting this informal reunion into the recognised formal *conversazione*, in which "evening dress" is *de rigueur* has been mooted; but, on due consideration, has been abandoned as inconvenient and undesirable. To many operators, printers, and other assistants, who have every claim to be present at the opening of the exhibition, the condition of attendance in evening dress is, practically, prohibitory; whilst, to many more it is inconvenient. When the condi-

"It will thus be seen that for only twice the distance or twice the diameter we require four times the power of light, for three times nine times the power of light, for four

tions were left open in this matter those members and their friends who, by habit or accident, found in conventional evening attire on the opening night, were not precluded from attending in such attire; whilst those whose convenience found them in walking dress were not debarred from being present. Success has attended the practice hitherto, and, we cannot but regret that a deviation, which had the effect of keeping many visitors away, was adopted on the present occasion. The fact that the attendance was smaller than on any previous occasion will probably prevent a repetition of this error another year.—ED.]

PICTORIAL BACKGROUNDS.

SIR,—your brief but lucid description of Mr. Tilley's patent method of producing "pictorial backgrounds," in last week's *News*, would suggest that the process is not without its difficulties and failures. It would appear that the "arrangement of curtains," &c., in the second exposure, would be rather troublesome, even if the best results can be secured. I have invented a method somewhat analogous, in the use of a transparency, to that of Mr. Tilley's, but without the apparent difficulties and complications suggested by the "curtains." If I do not feel infected with the general contagion of "patent" now prevailing, I will give a full description of my simple and effective method in the next coming *YEAR-BOOK OF PHOTOGRAPHY*. In the meantime any person can pay for and use Mr. Tilley's ingenious patented method, for which he deserves credit.—I remain, sir, yours respectfully, THOS. TEDRAKE.

Talk in the Studio.

MR. TILLEY'S MODE OF COMBINATION.—We have been favoured by Mr. Tilley with some examples of the pictorial backgrounds introduced by his method recently patented. They illustrate the admirable variety of effect which can be produced, some representing close scenes, and others distant and open landscapes. Some of the latter especially please us, the results being charming little pictures.

SAM WELLER AT FALMOUTH.—Mr. H. Garrett Cocking calls our attention to the fact that the notice in our last of the exhibition of photographs at the Royal Cornwall Polytechnic Society describes his contribution "Sam Weller," but attributes it to Mr. H. Garrett, without the addition of the surname. Mr. H. G. Cocking, as many of our readers know, is son of Mr. Edwin Cocking, now assistant secretary of the parent society, as well as secretary for many years of the South London Society. "Sam Weller" will be found in Pall Mall by those interested in his photographic presentment.

MEDALS AT BELGIUM EXHIBITION.—The following medals have been awarded to English exhibitors at the International Photographic Exhibition, held by the Belgian Photographic

Association. Silver medal offered by the president of the Association, Messrs. Spencer Sawyer and Bird; silver medal offered by the President of the Ghent section of the Association, Mr. Woodbury; bronze medal offered by the general secretary of the Association, M. Ogier de Jersey, for reproductions and enlargements in carbon; bronze medal offered by M. Count de Kerchove, M. Montiflore Levy, and M. Neyt, Mr. Brownrigg of Dublin, Mr. D. Hedges of Lytham, and Mr. F. York of Notting Hill, for his stereoscopic studies of animals; silver medal offered by M. Gantly, Mr. Henderson for enamels; bronze medal, Captain Abney for Transit of Venus photographs.

A "SPEAKING LIKENESS."—A curious illustration of the occasional danger of using figurative language in the ordinary transactions of business is afforded by a letter we find in the *Bristol Times and Mirror*. Mr. T. Thatcher, of College Green, Bristol, having advertised in that journal a likeness of the hero of the hour, Captain Webb, incurred an unforeseen trouble, which he describes in the following letter to the editor:—"Will you please omit the word 'speaking' from my advertisement 'Speaking likenesses of Captain Webb,' as on Saturday last a well-attired middle-aged female, apparently the wife of a well-to-do yeoman, entered my shop, and said to my assistant, 'I want one o' them speaking likenesses o' Captain Webb which I seed in the paper.' She was immediately produced a copy of the portrait in question. We were much puzzled at the manner in which she minutely examined the picture: first the face was closely scrutinised, then the edges, and last of all the back, feeling it all over in a most mysterious manner. She at length exclaimed, 'How d'y'e make'n talk, master, I wants to hear'n speak!' Observing her misunderstanding and embarrassment, I explained to her as clearly as possible that the word 'speaking' in the advertisement was not intended to be taken in its literal sense, but was a term frequently applied to portraits and pictures, denoting the life-like accuracy of the representation. She, however, appeared anything but satisfied at the explanation, and throwing the 'Captain' back again upon the counter, walked out of the shop muttering the words 'Twer a regular take in.'—I am, &c.,

"T. THATCHER."

RESTORING ENGRAVINGS.—To restore the whiteness of yellow and discoloured engravings, first wash carefully in water containing a little hyposulphite of soda, and then dip for a minute in Javelle water. To prepare the latter, put four pounds of bicarbonate of soda in a kettle over a fire; add one gallon of boiling water, and let boil for fifteen minutes. Then stir in a pound of pulverized chloride of lime. When cold, the liquid can be kept in a jug ready for use.—*Scientific American*.

To Correspondents.

W. M.—You cannot by any simple and efficient process remove the iodine from iodized collodion so as to make it suitable for enamelling. It would be possible to precipitate the bulk of the iodine as an insoluble salt, but the cost and trouble would be in excess of the value of the result. You may remove the greater portion of the iodine from each film, as you coat the glass, by soaking it in two or three waters before allowing the collodion film to dry.

DEVONSHIRE.—The enlargement is a good one, sharp and well defined; but the original negative appears to be a little hard, which would render necessary retouching in the enlarged print. Thanks, in advance, for promised Year-Book contribution.

POSTMASTER.—It should not be a difficult thing to stop out the holes perfectly in the sky of your negative. Take a little cadmium yellow, Indian red, or Indian ink, or any opaque colour without too much water, and applied with a sable brush to the holes in the negative, so as to quite cover them. You have applied the colour in too thin a state, using too much water. The only care necessary is to avoid spreading the colour beyond the hole, and so render it necessary to touch the print.

R. MITCHELL.—We have no information as to the how or when of sending contributions to India, for the Exhibition, beyond that published in the *News* a short time ago, in conjunction with the list of prizes and conditions of exhibiting. If we can get any information, we will let you know. We have an impression that Fox, of Little Britain, undertakes packing and despatching photographs for that occasion.

T. P.—No announcement has yet been made in relation to the South London Technical Meeting. The first ordinary meeting of the session is held in October, on the second Thursday in the month. As the Exhibition of the Photographic Society will continue open for nearly two months, there is plenty of time yet for the South London Meeting. We have every reason to believe that it will be held in due time.

CARD PORTRAITS AT EXHIBITIONS.—Several correspondents write to express coincidence with the remarks of "N" in relation to the exhibition of card portraits. "Operator" suggests that the Council of the Photographic Society should take the matter into special consideration, and make a feature of card and cabinet portraiture at the next exhibition of the society, offering medals for the best collection of twelve or twenty cards and cabinets. He also suggests that all operators throughout the country should make it a point to attend such an exhibition, which might easily be done if they commenced to save a weekly sum for expenses as soon as the announcement is made of the time and conditions of the exhibition. He thinks that employers would be glad to aid assistants in obtaining the educational influences of such an exhibition. "A Country Operator" says:—"Your correspondent N., has made some really good remarks in the *News* for September 17th., in reference to improving the standard of card work. Often, like him, have I wondered why so much attention was directed to large work, which, I think I may safely say, is not the support of one business out of every twenty. Alas, if more encouragement was given to operators than simply 'salary and commission.' Some such a plan as 'N' proposes, we soon should see great improvements on the very high-class work that even at present adorns our profession. It also has struck me, that there are, comparatively speaking, few facilities for country operators to see and study the best work now being done by some of the renowned artists in the profession; for, hundreds of thorough intelligent assistants have never had a chance to see an exhibition; and who have not even been to the 'great city' where are to be seen so many good specimens of all branches of photography." Another correspondent, "S. S." says:—"It was with no little interest that I read the article on the above subject in your issue of the 17th inst., the idea of which is no new one, but our brother of the black art, in his eagerness to reach a higher elevation, has, in my opinion, misad a lower but very important step, a step calculated to raise the status of photography in no small degree. There are many operators who have not a chance of seeing high-class work as turned out at other studios, in like manner many of them would not have the opportunity to see such an exhibition, these therefore would remain in comparative ignorance; it is evident then some system is required to educate our country operators." Both "C. C." and "Country Operator" think that a system of publishing fine examples of photography, which should be accessible to country photographers would be beneficial, and suggest that should follow the example of an American contemporary in issuing such examples. We fear that there are many obstacles in the way with which we are familiar, which are not well understood by our correspondents. In the first place, the plan is by no means an unqualified success, and by no means gives universal satisfaction where it is adopted. It is very difficult to obtain a sequence of photographs of such high-class that they all possess educational value, and the project involves much uncomfortable responsibility when the pictures issued come short of excellence, and fail to give satisfaction. In the next place, the American journal in question, each number containing a print, costs two shillings. Any attempt to make a periodic issue of pictures at such an increased price as would guarantee excellence in the examples, would probably be objectionable to a large number of subscribers, and it could not of course be attempted for part of our readers only. We cannot help thinking that a much simpler mode is available to country photographers. There are scores or hundreds of admirable examples of portraiture English, French, German, American, both cards and cabinets, published at reasonable prices. A selection of these is easily procurable, at a price not much exceeding cost of issuing them with a journal. We commend, also, attention to the remarks of "Operator."

PORTRAIT CLUB.—A correspondent asks for information as to the mode of establishing portrait clubs. Can any of our readers supply information?

V. L. J. (Oldham). We regret that our engagements do not leave us leisure to write private answers to questions from readers.

A. O.—The greater the separation of the lenses in a stereoscopic camera the greater the effect of relief; but for truth of effect the separation should be from three and a half to four inches. It is necessary to cut the prints, and transpose them because they have been practically reversed in the process of production. It is necessary to bring the picture taken by the right hand lens under the right eye, and so with the left, which can only be done by transposing the prints.

Several Correspondents in our next

The Photographic News, October 8, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

MEDICO-PHOTOGRAPHY—RECOVERING SILVER FROM HYPO BATHS—CRIMINAL PHOTOGRAPHY.

Medico-photography.—We are glad to see that the application of photography to medical science is once more attracting attention, and has found, in the person of Dr. Stein, of Frankfort-on-Maine, one competent of working out the subject. Last week we published the first portion of Dr. Stein's papers showing how matters stood before he took up the investigation, and his next contribution will describe, no doubt, what he himself has accomplished in the matter of registering the beating of the pulse and the action of the heart. As these two important functions are regarded by physicians as the main tell-tales of the human system, and medical men in forming a judgment or diagnosis of a case rely, to a great degree, upon the results they observe in respect to the heart and pulse, it is naturally of the utmost importance that they should be able to read and understand correctly what these vibrations really do mean. A written record of the pulsations of the human system, if perfectly reliable, would be of invaluable worth to a physician to enable him to form an opinion; and Dr. Stein tells us that the instrument now employed by medical men to register pulsations leaves much to be desired, the delicate ebbing of the blood through the arteries being hardly sufficient to move the double lever-action of the sphygmograph employed, the friction and loss of power involved interfering materially with the accuracy of the result. Dr. Stein has decided upon using a pencil of light as being an imponderable register, and aims at employing photography to depict the wave-lines of human pulsations. We have succeeded, says Dr. Stein, in registering the pulsations of the earth, the streams of terrestrial magnetism, the variations of the barometer and thermometer, and the changes that take place in the atmosphere of the sun, and all this by the aid of photography; we might surely learn something of the human system with the aid of light to help us. Dr. Stein, as many of our readers know, is not the first who has undertaken the praiseworthy task of cultivating medical science by the aid of photography. Indeed, in the very matter of photographing the action of the pulse, Dr. Stein has had a predecessor in the person of Dr. Ozanam, who made some very interesting experiments on the subject some seven or eight years ago. And these experiments, if they served no other purpose, proved one important fact, that double beating of pulse, or diastole, as it is termed, did not only exist, but—what was unknown till then in medical science—the beat was sometimes treble or quadruple in its action. Dr. Ozanam's mode of procedure was a simple one. The patient rested on a sofa, and a small reservoir of mercury, contained in a flexible vessel, was placed in the vicinity of the heart. In connection with the reservoir was a glass tube, and the mercury almost filled this in the manner of a barometer. With every pulsation the mercury rose and fell in the tube, and a sensitized strip of glass moving behind the tube at a certain uniform speed became impressed with a wave-line, the result of the mercury moving up and down. By magnifying this photographic image, Dr. Ozanam found that the action of the pulse was not represented by an even curved line, as would be the case if the vibrations were steady and regular, but that there were two or three rising movements in succession before the maximum height of the wave was attained, and the wave fell again by a double movement, and not in one continued ebb. This result alone was a valuable one to have obtained by the assistance of photography, but we have no record of Dr. Ozanam having followed up his interesting experiments or prosecuted the investigation any further. Dr. Stein, we trust, will make a still further

application of photography in this direction, and we shall look with interest to his further contributions to medico-photography.

Recovering Silver from Hypo Baths.—Good news comes to us from Berlin, that Dr. Vogel has been successful in discovering a simple and ready means of precipitating the silver contained in hyposulphite, or fixing, solutions. The expense of recovering a pound of silver is said to be but one shilling by this new method, and the metal, we are told, is obtained in the form of tolerably pure metallic silver. If this really turns out to be the case, Dr. Vogel will be rendering photographers a very great service indeed, for, as everybody knows, the recovery of silver from the hyposulphite bath is always a troublesome matter. Many photographers, indeed, do not think it worth their while to treat old hypo baths at all (notwithstanding the obvious fact that they contain both gold and silver in solution), by reason of the time and trouble involved, holding that the latter are scarcely repaid by the profits of the operation. The amount of silver contained in the hypo bath must vary, of course, with the way in which the prints have previously been manipulated, and while some hold that the proportion of silver to be found in the bath amounts to thirty-three and one-third per cent., or one-third of that used, others believe that ten or fifteen per cent. of the silver employed is the outside existing in the bath. But this amount would, if it could be removed with facility, pay for working in most studios, although, under present circumstances, it is always a question whether *le jeu vaut la chandelle*. Common salt, or hydrochloric acid, will not precipitate the silver, as in the case of the rinsing waters, and the mode of precipitation by means of metal is a slow and tedious one. The recovery of the precious metal by *hepar sulphuris* is also a laborious and disagreeable undertaking, and for this reason we shall be glad to have the details of the process which Dr. Vogel promises shortly. So little of the silver actually used by the photographer in his operations is to be found in the finished print, that we know to a fraction, almost, what amount must be actually contained in the washings and waste of the studio. It will be a happy day for the photographer when he can see his way to recovering the silver he uses to within a small percentage of its quantity.

Criminal Photography.—Great latitude exists, unfortunately in the depiction of our criminals by photography. We do not recognise such an official as photographer in our police, or criminal staff, and consequently there is no definite system adopted in the posing of the sinner, or in the style in which the photograph is executed. As our Paris correspondent mentioned some time since, there are in the French police service photographers having the rank of inspectors of police, who are entrusted with all duties connected with photography, and these are no light ones, we are told, in Paris. It was mainly, if not wholly, due to the special knowledge possessed by one of these inspectors that the spirit photographers recently convicted in Paris were discovered and exposed, for it would have been altogether impossible for any one not possessed of a familiar acquaintance with photography to have detected and followed up the fraud. In this country, the photographing of criminals, (for we do not avail ourselves of the art in any other way) is entrusted sometimes to wardens of the prison, sometimes to professional photographers and sometimes to an amateur directly or indirectly connected with the gaol. The consequence is, that the criminals are not all of them photographed in the same style, from the same point of view, and with instruments of a similar kind. Two portraits were recently placed before us by the police authorities, to decide whether they had been taken from the same original or not. Both pictures had been executed at county gaols, but in a different manner, and the police were anxious to know whether the two pictures related to the same man. In the one case the prisoner was looking a few inches above the camera, in the other a few inches

below, and this alone was sufficient to alter the aspect of the eyes and the lines of the mouth. One image, too, was a little in profile, while the other was full face, and, although the heads were pretty much of the same size, the circumstance that different lenses had evidently been used made the sitter appear much nearer in the one case than the other. We decided in the end that the two pictures did really represent the same man, as a dimple under the chin and prominent cheek bones settled the question, but the matter would have been far more easy to solve if all criminals were photographed according to a few simple and definite rules.

FRENCH CORRESPONDENCE.

DUCOS DU HAURON'S POLYCHROMIC PROCESS—REDUCTION OF THE EXPOSURE WITH THE ORANGE AND GREEN SCREENS—THE COLLODION EMPLOYED—PREPARATION OF CHLOROPHYLL—COLOURED FILMS FOR PRINTING OPERATIONS.

In a recent communication which M. Ducos du Hauron has addressed from Agen, his place of residence, to the local Society of Agriculture, Science, and Arts, that gentleman has described the improvements which he has lately added to his method of Heliocromy, and which, so he assures us, permit the reduction of exposure, either with the green or orange screen, to the ordinary period necessary for taking a negative in the usual manner. This is a very important point, for, till now, the lengthened exposure required made the process quite impracticable.

Whatever may be considered their value, we propose to enumerate the principal points in the memoir, of which M. Ducos du Hauron has been good enough to forward us a copy. To produce the three clichés which are necessary for the elaboration of a polychromic print, M. Ducos employs a pure bromide collodion containing three per cent. of bromide of cadmium, and a silver bath of twenty per cent. strength. He develops by the alkaline process, following the formulæ indicated by our late collaborateur, Mr. Thomas Sutton.

In order to render sensitive to the light transmitted by the orange glass that plate of the three to which it corresponds, he plunges it for a short time in an alcoholic infusion of chlorophyll, after having energetically washed it in the first instance. The film is then drained for a few seconds, and afterwards bathed in distilled water long enough to permit the alcohol being replaced by water. After a final draining, the plate is ready for operating.

The solution of chlorophyll is obtained by filling a bottle with ivy leaves that have been freshly gathered and cut into small fragments. Rectified alcohol of 40° is poured in until the whole of the ivy is covered, and the infusion is allowed to remain four-and-twenty hours. It is then filtered through paper, and a liquid of a beautiful green is obtained, which, viewed by transparence, has a reddish tint.

With this preparation, and by means of alkaline development, the exposure is not more than fifteen to thirty seconds in the sun with a doublet lens without diaphragm.

For the negative corresponding to the green glass M. Ducos du Hauron employs the same kind of collodion, but he puts into it four decigrammes of aurine to every hundred cubic centimetres of collodion. After washing in distilled water, the plate is plunged into a bath composed of—

Distilled water	...	...	200 cub. cents.
Carbonate of soda, pure	...	...	1 gramme
Neutral gelatine	...	...	1 "
Aurine	...	...	a few fragments

This is, it will be observed, Sutton's preservative with the addition of aurine. The exposure is rather less in this case than with the orange glass, and the development is undertaken with an alkaline liquid.

Finally, the cliché of the violet glass is obtained without any addition of colouring matter; nevertheless, the aurine collodion may be employed without inconvenience.

Plates prepared in this manner are tinted with chlorophyll and aurine respectively; they are afterwards freed from the colouring-matter by one or two treatments with alcohol. The three clichés developed separately have rarely the same intensity; they are equalized, after fixing by treatment with pyrogallie acid and silver in full daylight. To prevent any tendency of the film to rise, M. Ducos du Hauron recommends the application of a preliminary film of albumen (three per cent. in water).

Besides this method of operating with wet plates, in all such cases when rapidity is of importance, M. Ducos du Hauron has a plan of working to enable him to secure reproductions, or landscapes, or architectural subjects. This process does not differ much from that just described, only the collodion which is used is prepared with a pulverulent pyroxiline. The silver bath should be but slightly acid, that is to say, about two to four drops of nitric acid is added to every hundred cubic centimetres of collodion. Finally, when once prepared, the plates should be permitted to dry in a perfectly dark locale. It is also advantageous to use a slightly-acid bath in the wet process.

A dry plate, prepared in the manner just described, and washed in distilled water, gives, with the red glass, a negative in five or six minutes at the most, operating in the sun, and with a double lens without a diaphragm.

One of the greatest difficulties that M. Ducos du Hauron has met with in his investigation was the impossibility to obtain any coloured plates suitable for the printing operations, and this difficulty becomes graver when it comes to a question of applying the process in a practical manner. He has succeeded in surmounting the difficulty by simply employing colourless plates, upon which he applied varnish pellicles coloured alternately with films of gelatine, and thus dispensed with the use of coloured glass altogether.

To obtain a uniform film of varnish, the plate is gently heated before applying the liquid; after the glass has been drained, and before the film has had time to set, the plate is held at some distance above a heating arrangement, being kept the whole time in a horizontal position, and in this way a uniform and perfectly transparent film is obtained.

If it is desired to intensify the tint, or to modify it in any way by the superposition of another film of varnish, it is necessary, in the first place, to cover the film with a warm ten per cent. solution of gelatine. By allowing the plate to drain in a vertical position, there remains but a very thin film of gelatine, which dries exceedingly quick, and upon which it is possible to apply, without the slightest difficulty, a second film of varnish. By proceeding in this way you may superpose as many films as may be deemed necessary.

If it is desired to suppress the plate altogether, it is necessary then to rub it, in the first instance, with some ox-gall; then a film of gelatine is applied, which is first treated with a solution of alum, and then with water. Afterwards you proceed in exactly the same way as before, applying alternate films; and it is then only necessary to cut round the margins with a knife to separate the whole from the plate which has served as a provisional support.

The last experiments of M. Ducos du Hauron proved that in making use of chlorophyll there was great latitude permissible in the tint of the orange glass: it might vary between red and yellow without the corresponding cliché being materially modified. At the same time it must be borne in mind that the more yellow the tint is, the shorter is the exposure; and the nearer it approaches to red, the more accurate will be the reproduction. The orange-coloured varnish may be made more red, if necessary, by the addition of red coralline dissolved in alcohol.

For the green-tinted pellicle, a mixture of maize-yellow with a little Metternich green is employed. Lastly,

M. Ducos du Hauron makes his violet varnish by dissolving a little red fuchsine in blue varnish.

There are two things which it is well to note. Chlorophyll is a reducer of silver salts, and if in contact with a sensitizing bath, only fogged images are obtained; nevertheless, M. Ducos du Hauron thinks this defect may be avoided by acidifying sufficiently the silver bath. The chlorophyll may then be mixed without risk with the collodion, instead of being used afterwards for sensitizing plates. It is essential that only distilled water should be employed in the washing of the sensitive films.

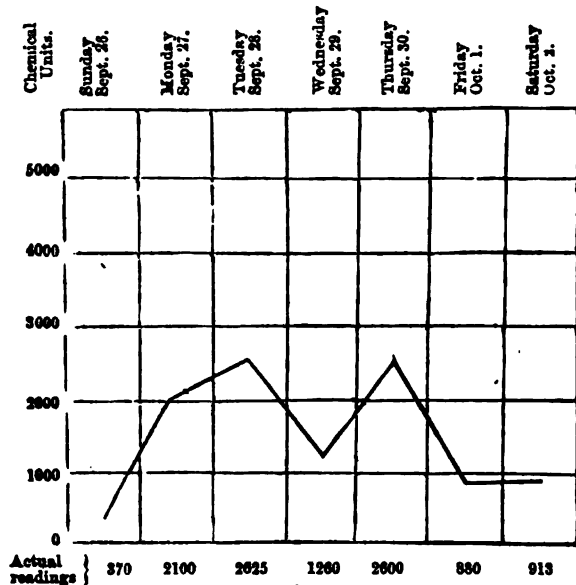
Unfortunately we ourselves were absent from Paris when M. Ducos du Hauron passed through the capital some days ago; we were, therefore, unable to see the specimens which he was so good as to bring for our inspection, to illustrate, in a manner, his memoir. At the same time, I trust very soon to be able to report upon the practical results he has obtained, as M. Ducos has promised to pay another visit shortly.

ERNEST LACAN.

METEOROLOGICAL REPORT OF THE AGGREGATE CHEMICAL INTENSITY OF THE DAY LIGHT OF THE SOUTHERN SKY, FROM OBSERVATIONS MADE AT BLACKPOOL, LANCASHIRE.

BY D. WINSTANLEY, F.R.A.S.

The daily average of light for the past week has been very slightly higher than that for the preceding week—i.e., as 1535 chemical units to 1522. The variations, however, have been less: the maximum not so high, the minimum not so low. The general aspect of the diagrams markedly indicates the waning vitality of the year. In the earlier days of September, a daily fluctuation of 3000 units was quite common, whilst, during the past two weeks, a variation of 2000 units has only been twice attained.



PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XX.

TONING, WASHING, AND MOUNTING.

Washing the prints.—There is a large percentage of silver in the print to which the light has not gained access, and is therefore not reduced, which would be wholly lost were

we not to take measures to prevent this waste. It is for this reason that we preserve the changes of water in which the prints are washed. It is better to have two dishes, which must be kept to this use alone; these we partially fill with water. Into the first, the prints are placed one by one, care being taken that they are not stained by the water before being thoroughly and evenly immersed. To accomplish this properly, take the dry prints in the right hand, and drop them one by one on to the surface of the water, and with the left hand immediately submerge them; this is safer than picking each print off with the wet fingers, as water spots are likely to drop on the others and so stain them, the water causing red spots which are not got rid of without difficulty. After the prints have been turned and moved about in this water for a few minutes they are placed in the second dish; the water of the first poured into a tub for reduction, and the dish filled up with clean water. The prints are thus washed in four or five changes of water, all of which are preserved. To the last change of water enough salt is added to make it taste saltish. This will give the prints a cherry-red hue. They may then be washed in clear water, and are ready for toning.

When the prints are all washed, a handful of salt is thrown into the tub in which the washings have been preserved, and thoroughly stirred, the effect being that the free nitrate dissolved in the water will combine with the chloride of sodium (or common salt), and precipitate as chloride of silver by the morning. Too great addition of chloride of sodium will cause it to settle very slowly. When the water is clear, to test which, draw off a tumbler full, and add a little salt; if no milkiness can be detected, the silver has all been thrown down, and the water may be carefully drawn off, leaving the precipitate undisturbed at the bottom.

THE TONING BATH.

Toning is a reduction of metallic gold on the prints; the chlorine previously in combination with the gold, uniting with the silver in the print, produces protochloride of silver (this bleaches the print, and therefore allowance is made for this as for the effect of the fixing towards reducing the tone of the print, it is printed about one third darker than we desire in the resulting picture) and the metallic gold being set free deposits itself on the silver.

If a solution of chloride of gold is made alkaline by the addition of bicarbonate of soda, decomposition sets in, it being no longer restrained by the acid, and for this reason the stock solution of gold is kept slightly acid.

The substances used to accelerate the reduction of gold in the toning bath are various, such as, the acetate, carbonate, chloride, phosphate, &c., of soda; but their influence is on the reduction of the gold, not on the tone of the print, they being added to accelerate the action of the gold only, as in its acid state it would precipitate too slowly.

There are a great number of good formulæ for toning baths, almost every printer having a favourite preparation, but the subjoined is a thoroughly reliable one:—

Pure water	...	...	64 ounces
Acetate of soda	...	...	120 grains
Gold (neutral)	...	...	15 "

This bath may be used again and again, being simply strengthened before each toning with the chloride of gold solution kept in stock.

Pure water	...	...	15 ounces
Chloride of gold	...	...	15 grains

The quantity varying according to the number of prints to be toned—say half a grain of gold (or half ounce of solution) to each sheet of paper toned. The bath should be thus strengthened in the morning ready for use at the day's end, that the gold may precipitate the more readily. The toning bath, having been used, may be

poured back into a bottle, and allowed to settle, the clear bath being decanted when set out for use, and the precipitate put aside.

TONING.

The prints, after being thoroughly washed, are placed one by one in the toning bath. To do this without staining them (as would result if they are touched with fingers on which are traces of the toning solution), take them separately from the dish of clean water in which they lie, after washing, with the right hand, and drop them upon the toning bath; and, with the left hand, gently and quickly submerge them, to prevent unequal action of the toning bath. They must be kept in constant motion, to insure even toning. The light by which you tone should be shaded, that it falls on the prints, and not in your eyes.

To treat this manipulation exhaustively would require much more space than I can command here; for though a safe rule to follow is, that toning should be conducted till the prints have the appearance you desire them to have when finished, it would be necessary still to explain what that appearance should be in the different prints. All pictures do not require the same tone. For instance, to tone the portrait of a blonde to a black tint would be hardly satisfactory; nor would a brunette be suitably represented by the red, however fond you might be of that tone.

I do not wish you to have the idea that I suggest it is possible to reproduce nature in this respect, but that I only desire to point out two extremes to prove that modification of tone is necessary. Thought must be exercised in this.

Weak prints should be toned face upwards in a weak toning bath; and hard, intense prints in a strong bath, face downwards. The effect of toning the prints face upwards is to make the operation slower, and turning them face downwards to accelerate the action of the bath.

The chocolate tone is produced by toning a little longer than for the red; a decided brown by toning beyond the chocolate; and a purple tone is produced between the chocolate and the brown, continuing the toning until the print shows the slightest possible sign of the tone, when it should be removed.

The blue tone is not generally 'admired, a pleasant tint of that colour not being easy to produce unless the negatives have very excellent printing and toning qualities. The black is produced by toning full strong. The prints, as they are toned, are placed in a dish containing clean water, which stops the toning, and all being toned, the bath is put away and the prints are placed in the

FIXING BATH.

Great caution must be exercised that the prints, in being placed in the fixing bath, are not spotted with the solution, or imperfectly immersed. The same precautions should be taken as those already advised against staining with water, but, if possible, to a greater degree.

The fixing bath is composed of:—

Water	...	...	...	10 ounces
Hyposulphite of soda	...	...	2	,,

With about one grain of bicarbonate of soda to the ounce of solution to neutralize any free acid that may exist, acidity having the tendency to decompose the hyposulphite and liberate sulphur, which, as sulphide of silver, is thrown down on the prints as a black deposit, and materially affects the tone. The fixing solution should be fresh every day, and the dish used for this purpose alone. In the winter this solution may be made lukewarm, the action of the cold bath being very slow. Keep the prints in constant motion, and take care that they do not adhere to one another, or imperfect fixation is the result. Ten minutes will be about

the proper time for fixing, but if, on holding the prints up to the light, they present a mottled appearance in the shadows, they are not sufficiently fixed.

Properly fixed, the prints are clear and transparent in the shadows. It is well to place them in water containing salt in the proportion of a handful to the gallon of water. This displaces the hyposulphite to a great extent, and is a preventive of blistering.

THE WASHING OF THE PRINTS

should be very thorough, several changes being made, and, finally placed in the washing apparatus, they may be allowed to wash all night.

CUTTING AND MOUNTING.

When thoroughly washed, they must be dried if they have not been cut previous to the toning. This is, I think, the best plan, but by many it is objected to on the grounds that the toning and washing frays the edges of the prints. I have seen thousands of prints treated in this way, that were perfect when finished, and with not so many torn and spoiled prints as when toned in the rough. If they are to be cut afterwards, they must be dried in a blotting book. The print is placed on a sheet of glass under a glass form of the size required, and cut round with a knife.

The prints should be placed in their different sizes in heaps, and pasted over evenly and cleanly with starch, which is made by moistening pure starch with water, and mixing it until it becomes a thick paste; *boiling water* is then poured rapidly and steadily upon it, the starch being stirred all the while, until after thinning, it gets thick again. The result, if it has been properly made, is a smooth, soft paste. The best white starch should be used.

Pasting.—Care must be taken, in pasting and mounting, that none of the starch is smeared over the prints or mounts. Placing the print on the mount in its proper position it is rubbed down by the hand, a clean piece of paper being placed between the print and the hand.

Mounting.—See that there are no hairs or lumps under the print before you fix it in position, and guard against dust contaminating the mounts. A great deal of difference in the effect of the picture may be made in the position of the head in the cut picture, too great margin being left at the top of the head giving a stunted appearance to the figure, and *vice versa*. So too, in unequal cutting of the sides, the picture being cut with the figure forward gives it the appearance of a person desirous of walking off the card, or with too much margin in front, the idea of your customer being anxious to gracefully (?) back out of it. When dry, the prints may be burnished, spotted out, and finished.

RELATION OF THE SILVERING TO THE TONING BATH.

BY CHARLES W. HEARN.*

THERE are a great many photographic printers and toners who are daily in the habit of silvering and toning photographic paper, both plain and albumen, who do not, nor never have, paid the least particle of attention to several matters, viz.:—

- 1st. The relation of the silver to that of the toning bath.
- 2nd. The relation of the silvered paper to the toning bath.
- 3rd. The different effects caused by the preparation of the toning bath.

Taking up these three topics in their order, I will endeavour to show, in the first place, why these two baths

Photographer.

ought to be worked in harmony, and also what disastrous results follow their discordance.

To a careful observer of the results of a peculiarly made nitrate of silver printing bath, there is always much valuable information derived, and which, from inference, has often led the party to adopt or discard some particular chemical, as the case may be; and, when wisely done, is very instructive, besides being strongly indicative of a sound judgment. This is especially the case when experimenting with differently compounded negative collodions.

Now, seemingly the fact, whether our silver printing bath is alkaline, in a greater or less degree, does not seem worthy of contemplation as long as it is alkaline, for as long as it is so it will be "all right," by which is meant that the paper will not print "red and flat," but, as it often said, of a "rich colour" when it is of a decidedly "dingy blue." To suit another class of printers, I will soften the above expressed opinion, and say "the paper bath is 'all right' as long as it prints neither 'red nor flat,' nor 'blue or dingy.'"

Now, without regard at present as to how the paper prints, for that will be treated of hereafter, let us notice the action of a properly made toning bath upon the silvered paper.

We will suppose the print placed in the toning bath has a rich red colour; you watch the action of the gold bath upon it, and admire its beauty as this colour commences to disappear and assume a richness and delicacy of tone that will cause a thrill of pleasure to run through your entire being.

If your nature is a sensitive one to the admiration of the beautiful bordering on the delicate, you will at this time behold new beauties in the art that will stimulate you to greater and loftier attainments in your calling, and for the time being you will be utterly oblivious to aught else but the work upon which you are engaged. (Alas! that such concentration of the mind cannot at all times be commanded is a fact for us all to deplore.) Visions of the future, all of which will flatter your vanity immensely, will continually be passing through your mind as you contemplate the beautiful appearance of the print in the bath. Why will not such thoughts come to our assistance when the body is more or less prostrated, and the brain gives indications of approaching exhaustion through ceaseless toil, and seemingly with so little accomplished, that we are "far below par" in our own, and long ago in others' opinion? If like thoughts were to come to our aid at such times, with what greater rapidity would we get all things righted again, and everything would then run as smoothly as oil upon the troubled waters.

Now the time has come when the print, placed in the gold bath, is ready to be removed to a tank of running water until ready for the soda bath. In the meantime you proceed to tone the rest with a hopeful heart, congratulating yourself the while that your prints, on the following morning, will be "splendid."

They are toned; they are fixed; you are disgusted; you are mad; and what for? Simply because your prints are "over-toned." And why do you blame "the boy?" who, probably, had not taken interest enough to have anything to do with them (strange to relate). Is it not rather a surprising fact to note what credence is always to the blame attached to "the boy," if anything happens to go wrong with any of the "skilled workmen?" So do not blame that much-to-be-pitied assistant, but attach the blame to yourself. "Well," you may ask, "how can that be? for I toned them just exactly as red as I did last night, and here they are as blue as an indigo bag. No, the fault is not with me, for the reason I have just stated, but with the chemicals, and most probably with that toning bath." Poor soul, you do not think that the trouble is not with your toning bath, and were in great trouble until time changed it for the better, and ever afterwards it remained

a fact, that this was only one illustration of the much-quoted remark about the "fickleness of chemicals."

Now, why did you over-tone? Was it because you were mistaken about letting the prints remain in as long and until they reached the same tone, as they did the preceding evening, or not? No, you did right there; the trouble was nothing else than that the silver bath was more alkaline than it was the preceding day.

Probably you had either thought that the bath for sensitizing was not alkaline enough, and had placed some more in, or had made up a new one, which was, when ready for working, more alkaline than the one used on the day previous, and was either the result of ignorance or intention; if the latter was the case, then ignorance was displayed at the toning bath by the party operating upon it.

There is another way in which the desired alkalinity of the silver bath may be changed, and, coming as it does, from an unsuspected source, has often made the solution, sometimes rapidly but more generally gradually, alkaline, and the bewildered toner finds he is continually over-toning, and that he is at times very uncertain about the result of his labours. This trouble arises from the stock solution—or, as it is sometimes called, "adding solution"—which is nothing else than a fresh bath of silver and water, of a greater strength than the one in use. If care is not exercised in the preparation of this solution, it is very likely to be made right alkaline, and, being a new and pure bath also, it will gradually change the regular solution to a state that will very often mislead the party or parties working with it. For this reason, and others too numerous to mention here, it is always advisable to test the bath every morning before use, to see how the strength is, as well as the alkalinity of it.

Now, why does the alkalinity of the silver bath affect the tone of the prints? you may ask. It is a well-known fact, with many of the solutions used in photography, that the nearer the baths approach to alkalinity the quicker will be the action of light, &c., upon it. This is seen in the case of the negative bath. The nearer this bath approaches to an alkaline state the quicker will it work as regards exposure, and the more acid it is the slower. When we desire to keep our stock gold solution from "throwing down," we do not make it alkaline, but acid, because in the latter state the acid holds it in suspension. When we desire to sun our bath, whether negative or positive, we first make it alkaline, so that the organic matter will be precipitated. When we boil our bath we also make it alkaline. When we tone prints we make our gold solution alkaline, so that it will tone both with rapidity and ease, and be also economical and delicate. So it is readily seen that alkalinity hastens operations, and hence the conclusion that the more alkaline the solution may be the quicker the deposit.

Now this is evident in the case of the silver bath. When it is only slightly alkaline, and the toning bath is likewise, then the harmony between the two will result in excellent work. When the silver bath is quite alkaline, and the toning bath is slightly so, there is then no perfect harmony between the two. The action of the toning bath on prints printed upon paper floated on a very alkaline silver bath, is as follows, viz.: The gold in the toning bath commences of course to precipitate on the print, and if the bath is not too strong, why it is done in a gentle and delicate way to all perceptible appearances, and at this state of affairs, it is always done in a way that will call forth very frequently admiration from the workman.

Now, the way the print was prepared, previous to its entering the toning bath, has rendered it so that it is in a state to take up the gold much more rapidly than what is perceived by the eye, or supposed by the judgment, owing to our knowledge of the strength and alkalinity of the toning bath, and the result is simply an over-toned print.

The Photographic News.

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MR. JOHNSON'S DISCOVERIES IN THE CARBON PROCESS.

A COMMUNICATION from Dr. Van Monckhoven on this subject which we print on another page reduces the question to well defined limits, and happily enables us to prove conclusively the indisputable claim of Mr. Johnson to those discoveries which through misapprehension have been called in question, and which in a recent article we felt called upon to vindicate. Dr. Van Monckhoven states the case, so far as his statement is carried, with the fairness and moderation we expected from him, and hence, we shall have the less difficulty, when we suggest certain considerations and facts which have escaped his attention, in satisfying him of the source of the error into which he has fallen. The position he assumes is, that the adhesion between the carbon tissue and the albumenized paper in Mr. Davies' experiments was not due to the stickiness of the albumen, but to atmospheric pressure, and that, therefore, Mr. Johnson was not the discoverer of the principle of mounting the exposed tissue by atmospheric pressure.

Dr. Van Monckhoven will readily see, we apprehend, that it is quite possible to accept his premises without admitting his conclusion. It is quite possible that thousands of the carbon prints which were mounted on albumenized and other surfaces were really united by atmospheric pressure, without any one recognizing the fact or discovering the principle. The phenomena upon which all discoveries are based exist ages before the discovery is made. Almost all great discoveries depend upon the intelligent recognition of the principle underlying some well-known fact, and the perception of the unknown possibilities and application of which such principle is capable. But we shall go further, and prove not only the fact of atmospheric pressure in mounting carbon prints was not known, nor the existence of the principle even suspected; but that in all cases, prior to the publication of Mr. Johnson's discovery (no matter what the matter of mounting adopted) the idea of adhesion in virtue of the existence of a sticky surface was the only principle recognized.

Dr. Van Monckhoven says that the carbon tissue in Mr. Davies' process was not made to adhere to the mounting paper by means of the stickiness of the albumen, but by atmospheric pressure, and in proof of his position he sends us some examples of carbon tissue made to adhere to plain paper, and also to blotting-paper. It is not necessary to discuss at length the precise physical laws by which adhesion in the cases in question was secured. The theory of the matter contained in Dr. Van Monckhoven's letter does not cover the facts. In the examples he has sent us, it was certainly not to atmospheric pressure—or, at least, to that alone—that adhesion was due. To this we shall refer by-and-by. In the meantime, as we affirm that no idea of atmospheric pressure entered into the minds of experimentalists before Mr. Johnson's discovery, let us proceed to justify our statement. It may be well to

point out what the aim of all experimentalists really was. When once the idea of the necessity of exposing the carbon print at one side, and developing it on the other, was well understood, the aim of carbon experimentalists was to mount the tissue with some material which should be insoluble, or could be made insoluble, in the water used for development. If single transfer were the aim, any adhesive material which could be made insoluble in water served; but if double transfer were required, then the mounting material, whilst insoluble in water, must be soluble in some other menstruum which could be applied after the print was developed and drained. In Mr. Swan's process, published in the spring of 1874, which was essentially a double transfer process, india-rubber was used as the cementing medium, because whilst it was insoluble in water, and so held the tissue form during development was soluble in benzole, and allowed the developed image to be transferred to another surface. During the same year Mr. Blair, at a somewhat earlier date than Mr. Davies, described a single transfer process somewhat similar to that of Mr. Davies.* He treated the carbon tissue with albumen, and coated a piece of white paper with albumen and pressed the two into contact, afterwards coagulated the albumen with boiling water and proceeded to develop. It will readily be seen that if the albumen had not been coagulated after the tissue was mounted it would have been at once dissolved when the print was placed in water to develop, and would drop apart from the tissue again. But the adhesion having been secured whilst the albumen was in a sticky state, it was continued, in spite of the water, when that albumen by coagulation had become an insoluble cement. In a subsequently published process, Mr. Blair secured the insolubility of the albumen by exposing the back surface of the paper for a few seconds to light, the traces of chromic salt which it had absorbed rendering the albumen insoluble under the action of light. The chief drawback to processes of this kind was the fact that the cement being insoluble it did not admit of further transfer, and the print, in its reversed form, had to remain upon the support upon which it was developed.

Next we have the process of Mr. Davies—or, rather, the two processes, a single transfer and a double transfer process. Like Mr. Blair—but doubtlessly as the result of an independent course of experiment—he uses in his single transfer process albumen as his adhesive material. He uses it in its soluble or sticky state to obtain adhesion, and he then coagulates it with alcohol to prevent its solution when the print is placed in the water to develop. Here Dr. Van Monckhoven sees adhesion by atmospheric pressure, not by the sticky quality. We doubt very much whether atmospheric pressure in any legitimate sense can be supposed to be in operation here; but it is clear that no notion of such adhesion was entertained. If it had been it would have been easier to use a piece of coagulated albumen at once. But in the double transfer process we have still stronger evidence that no adhesion by atmospheric pressure was dreamed of. In this case a cement insoluble in water, but soluble in some other menstruum was required, and a solution of shellac and Venice turpentine was used. If the notion of atmospheric pressure had been entertained, such a varnish might have been applied to paper and allowed to dry, so as to form the impervious surface necessary in atmospheric pressure. But nothing of the kind was done; on the contrary, the lac and turpentine were used as a "paste" to attach the two surfaces. The whole idea in both cases was to obtain a sticky or cementing material which will not dissolve in water whilst the print is developing. At a subsequent date albumenized paper coagulated beforehand with alcohol was used for transfer. But the surface of coagulated albumen, although insoluble in water, when soaked becomes

* In a letter dated July 5th, published in the *Photographic Notes* of August, 1864.

sticky, and permits of the adhesion of the carbon tissue, and M. Jeautoreaud, describing a process of the kind, attributes the adhesion not to atmospheric pressure, but to "the very great adhesive power possessed by albumen coagulated with alcohol." It is quite possible, in this case, that atmospheric pressure played an important part in the adhesion; but the manipulator knew nothing of this: the principle had not been discovered.

But we proceed still further in disproof of the atmospheric pressure theory having any existence until announced by Mr. Johnson. And we must mention here the examples of carbon tissue with which Dr. Van Monckhoven has been good enough to favour us, in support of his view that atmospheric pressure is sufficient to unite carbon tissue to other surfaces without the aid of albumen. He sends us examples on plain paper, and on the back of albumenized paper, which, as he states, are perfectly adherent. But this is not adhesion by atmospheric pressure. These are simply pieces of carbon tissue without bichromate or exposure, wetted and attached to paper. They are simply held by the stickiness of the gelatine, and are really glued together.* When placed in tepid water they separate at once, not leaving the carbon and gelatine upon the mounting paper, as they would be required for development, but the mounting paper being apparently the most penetrable of the two, the gelatine in contact with it softens first, and leaves the tissue nearly intact. But the mounting of carbon prints on plain paper for development is possible, and has been practised. Early in 1868, Dr. Vogel published the results of some experiments in this direction. He found that the exposed tissue, brought into close contact by pressure with moistened paper, adhered so closely that no separation took place when the print so mounted was placed in the water for development. Various inconveniences, such as the peeling of the film at the edges, and other uncertainties were encountered, and the plan was not generally adopted.

But there is another point of some importance to be noticed. In the process of Mr. Davies, it is manifest that the coagulated albumen acted as a cementing medium, and that adhesion by atmospheric pressure had no place in the process. The developed print in his albumen process was cemented fast to the paper, and cannot be removed, which could easily have been done if atmospheric pressure alone had attached it to the paper. But where double transfer was required, a different method had to be employed with a cementing medium which could be dissolved or softened by means of a suitable solvent; whilst in the subsequently discovered process in which adhesion by atmospheric pressure was employed, no such aid to a double transfer was required.

That Mr. Johnson was the first to discover, the first to announce, the principle of adhesion by atmospheric pressure, and the first to work out and utilize all the possibilities of such a mode of working, we think there cannot be a reasonable doubt. His claims were never challenged when they were first put forward, but were hailed far and wide as legitimate, and for a most important and ingenious novelty. The bare discovery of the principle was not all. For instance, Mons. Andra announced in Paris the discovery of a method of mounting by atmospheric pressure, a few months after Mr. Johnson had made his discovery public; but admitted, at the same time, that after the tissue had been mounted on glass and developed, the adhesion was so firm he had found no means of transferring it from thence. He found, as Dr. Vogel had found, that the gelatinous film of the carbon print had a sufficiently adhesive

or sticky surface to adhere tenaciously to a surface with which it was brought into close contact. In Mr. Johnson's method is included not merely the discovery of a principle, but a system of working; not merely the discovery of a method of mounting the tissue for development upon an impermeable support by the aid of atmospheric pressure, but a means of preparing that surface so that the developed print may be easily detached. It is no part of our purpose here, however, to point out the variety of advantages involved in the system of working, we simply refer to them as naturally following the application of the new principle, and impossible before its recognition.

We have no wish to prosecute a discussion, unprofitable, and to the general reader uninteresting, on the various other items, in Mr. Johnson's patent. Nothing is decided by such discussions in the columns of a journal. It is probable that each disputed point in the said patents would require for its due consideration as much space as we have already devoted to the establishment of the cardinal discovery of the new system of working, of which Mr. Johnson was the author. We are satisfied that if it had been Dr. Van Monckhoven's duty, as it has been ours, to watch every step of progress, examine every claim, in connection with carbon printing, especially since the period when Mr. Swan made it a practicable process, he would have been one of the first to pronounce Mr. Johnson's discovery was not only genuine and original, but that the idea upon which it was based had not even been claimed by any earlier experimentalist.

THE PRESS AND THE EXHIBITION.

IN accordance with our usual custom, we reprint the criticisms of the lay press on the Exhibition of the Photographic Society.

(FROM THE OBSERVER.)

THE annual exhibition of the Photographic Society, which for many years has been one of the few displays open in the autumn, is this year held in the convenient newly-built water colour galleries in Pall Mall East, an improvement in every way upon the *locale* which it formerly occupied in Conduit Street. The collection numbers more than 400 frames, and is, as might, perhaps, be expected, very miscellaneous. It differs to some extent—but not to a great extent—from the exhibitions of former years in quality, and it maintains fairly well the average of merit already reached. It is, however, somewhat disappointing that after so many years of work in so attractive a field our photographic artists should not have been more uniformly able to reach a high level of excellence. There are in the present exhibition individual photographs which serve to show that the art, notwithstanding all climatic disadvantages, can be carried to absolute perfection in this country. Why is it, we are disposed to ask, that so many who practice it are content to remain so far below this point? and why are so large a majority of the views and portraits of each year not more than fairly good photographs? These are questions more easily asked than answered; and were we to press them far, we might be in danger of persuading our readers that there is hardly enough in the present exhibition to reward them for visiting the gallery. This is very far from being our wish; the exhibition will well repay a visit, and it includes some few photographs so good that they would be almost worth visiting were they displayed alone. Conspicuous on the walls are numerous enlargements of portraits and groups. A few of these, especially those exhibited by the Woodbury Printing Company, are very good, but in many cases defects have been quite as obviously magnified as merits. The most interesting enlargements, as far as subject is concerned, are, however, Mr. Dixon's (110-118) groups of portraits of the officers on H.M. ships *Discovery* and *Alert*, forming the Arctic Exploration Expedition. These portraits are also exhibited on a smaller scale, and they fulfill to the utmost the best office of photography; they make familiar to us the aspect of men in whose fate the nation takes the deepest interest, with their surroundings, for the photographs include portion of the ships themselves. We cannot but feel that the mark of vigour, energy, good humour, and quiet power which can be traced in these portraits augur well for the success of the exhibition.

Messrs. Faulkner and Co. exhibit a most interesting frame of children's portraits, in all varieties of dress and undress, and in nearly

* It is difficult, perhaps, to state precisely what part atmospheric pressure plays in many cementing processes. A joiner in making a joint with glue works out as much of the glue as possible, so that the adhesion has been said to be due less to the cementing powers of the glue than to its action in filling up all interstices, and producing two absolutely plane surfaces which, when in perfect contact, adhere perfectly by atmospheric pressure. But we do not enter in detail into the argument as to how far adhesion of the carbon tissue to albumenized or plain paper was due to atmospheric pressure, because, even if we admit that as a fact, it was not recognised as a fact; the principle, in short, was not discovered.

every instance a degree of unconscious grace, and an absence of constraint has been secured which must be the envy of photographer^s whose sitters are of more mature age, and, consequently, apt to resent the propping up and pulling about process to which the unhappy subject of a photographic portrait is usually subject, and to show it accordingly. One of the best (if not the best) pictorial attempts displayed is one made by the same photographers, who, with admirable success, have arranged a close copy—if one may call it so—from life, of a picture by Reynolds. Two frames of portraits of strongly-marked and, in many cases, grotesque heads, exhibited by Mr. Payne, of Aylesbury, demand a word of notice; they show the infinite variety of which the human countenance is capable, and demonstrate that nature can surpass all that the caricaturist attempts, however facile be his pencil.

Turning to the landscapes—for which, from the first, our English school of photography has been deservedly celebrated—we find many interesting examples on the walls, and some still finer ones shut up in a folio on the table. The most conspicuous exhibitors in this branch of the art are Viles, Crawshaw, Bedford, the School of Photography of the Royal Engineers at Chatham, and Watkins, of San Francisco. Mr. Bedford contributes a series of small views of Chiswick, taken by command of the Prince of Wales, which, for delicacy, for good definition, and, above all, for artistic composition of the subject, have never been surpassed. Mr. Crawshaw's contributions run these very close, and, indeed, resemble them in all these points to a large extent. Nor would it be difficult to single out individual photographs by other exhibitors which approach the same level, but for uniform excellence through a series of similar views these two contributors stand alone. The execution of many of the contributions by the Royal Engineers is singularly good. They have accomplished one or two of the best enlargements exhibited this year. Such, for example, as the "Colossi at Rameses" (295), and they have attained great success in dealing with light and shade. Indeed, no better example of what may be called photographic chiaroscuro caught our eye than the fine view of oaks in Knole Park (253). Mr. Edward Viles has enriched the exhibition by several views of good size and generally excellent execution, though, perhaps, inclined to heaviness in the shadows, representing subjects but little known. Such, for example, are his views of Moreton Corbet Castle, Tong Church, and Pitchford Hall. None of these are names which are familiar to the searcher after the picturesque, yet they are all of them well worth seeing, and the visitor will thank Mr. Viles for an introduction to these English antiquities.

Interest of subject probably culminates in the photographs by Mr. D. L. Mundy of New Zealand, of scenes including hot springs, geysers, and other natural objects of the wildest and most striking appearance. It is, however, unfortunate that the quality of these photographs is not so good, technically, as might have been wished, and though we cannot feel surprised that in such wild spots the art must have been practised under great disadvantages; still some of the views have suffered. Excellence of workmanship and thrilling interest of subject, are, however, combined in the folio of views contributed by Mr. Watkins of San Francisco, and we regret extremely that these, which are the most interesting objects in the collection, are not displayed to better advantage.

Views of Utah and the Mormon country, of the far-famed Yosemite Valley, and some of the lonely islands of the Pacific, form Mr. Watkins's contribution, and we never remember to have seen better photographs—certainly never photographs of more magnificent scenery.

(The Times, October 4.)

The opening of the Photographic Society's Exhibition in the Water-Colour Society's Gallery, with an unusually excellent collection of examples of recent photographic work, principally English, though with a few specimens from Germany and California, presents an opportunity for calling attention to some remarkable applications of photography, in which Germany has, of late, very decidedly taken the lead of England. We see no indication of any superiority in the work of German photographers over English, either in the taking of portraits or views from nature. Judging by the remarkably elaborate full-length portraits (16-17) sent to this Exhibition from Dresden by Hugo Thiele, and the Viennese and Berlin examples so familiar to all of us in the shop windows, we see in German photographic portraiture, along with a great deal that is showy and effective, no little that is objectionable in taste, and exaggerated in light and shade. We have never seen any German portrait photographs comparable with the best examples of our own best men, as, for example, to

confine ourselves for the present to the Photographic Society's Exhibition, Mr. Blanchard's portrait of Salvini (96), the only one of the innumerable photographic pictures of the famous Italian actor, which, to our mind, gives the head its real dignity and impressiveness, without any melodramatic exaggeration; or Mr. B. Faulkner's exquisite studies of children on porcelain, and one frame of enamels by him (70, 823, 396-7), which, by the good taste of their arrangement and *pose*, as well as their success in rendering the charm and grace of childhood, recall the pictures of Sir Joshua. That Mr. Faulkner occasionally confesses to an intentional imitation of our great portrait painter does not detract from the beauty and attractiveness of his work.

As if to enforce by contrast the beauty and innocence of childhood, Mr. Faulkner's large frame of studies from children (396), has been hung opposite to two of the most remarkable collections of villainous physiognomies we have ever seen recorded by the unflattering pencil of the sun (407-408), being physiognomical studies of criminal men, women, and children, contributed by S. G. Payne, of Aylesbury. This is an employment of photography certainly not contemplated by its inventors, but by no means one of its least practical uses. The practice of photographing prisoners is now common, and serves a doubly useful purpose, helping identification and recording improvement in the few cases where there is any to be recorded. For the student of physiognomy in its more repulsive aspects these Aylesbury frames will have a painful attraction. Though still enough and to spare, there are this year fewer life-size portrait photographs than usual, for which we must express our gratitude to the arranger of the exhibition, and fewer than we have been accustomed to look for of attempts to make pictures by means of the camera. In one instance we were struck by as near an approach to a picture, in a composition of photographic portraits, as is compatible with the conditions of photography. This was in an exceptionally well arranged group (119) of two female full-lengths, by R. Slingsby, Lincoln, in which the composition of the figures and the arrangement of the furniture are alike happy and tasteful, and all the objects introduced seemed to fall into the picture without forcing. But there are not wanting many examples of posed groups as bad as this particular one was good. Indeed, to succeed in such groups requires in the photographer a rare amount of artistic knowledge, the immense value of which is very strikingly shown in the work of Mr. Faulkner and Mr. Slingsby to which we have referred.

We do not purpose any detailed review of the landscape photography in the exhibition, but we must congratulate the Society on its high average quality, both in the choice of subjects and the perfection of the photographic work. Of especial interest, as illustrating the value of photography for record of nature and archaeology, are the admirable views in Egypt and in Knole Park from the Royal Engineers' School of Photography, conducted to such excellent purpose by Captain Abney at Rochester, and the series of beautifully executed views in New Zealand, taken by Mr. D. L. Mundy, during a toilsome three years' traverse of the islands with his photographic apparatus on pack-horses. Mr. J. S. Stoddart's cloud studies (381) should also be noticed, as likely to be not less useful to the artist than the many elaborate studies of foreground foliage and trees which photography has placed at his command, and which the painter now-a-days often loves, not wisely but too well. The fine study of a huge greenstone boulder on the beach at Hokianga, from Mr. Mundy's series, and two frames of enlargements of microscopic objects are among the few examples here shown of photography put to philosophic uses, as the two frames of reproductions of lace are of its application to an industrial art. The society's exhibition this year is, indeed, rather interesting for its many illustrations of methods of printing and enlarging, most of them developments of the autotype and Woodbury processes, than for its examples of new or varied applications of photography.

Strange to say, besides a few indifferent reproductions of foreign pictures from the International Exhibition, by W. England (13-140), there is only one specimen on these walls of a photograph from a modern picture. This is (194) an excellent photograph by Mr. Hollyer (who also sends some of the best animal studies of the exhibition), of a graceful full-length figure of Mr. Albert Moore. There is not a single reproduction of an old picture. And this brings us to the work in which German photography has so completely taken the head of English, viz., reproduction of the old masters.

France may vie with Germany in the use to which she has turned photography in lieu of engraving for contemporary art. Messrs. Goupil and Co. annually produce a photographic record,

on two scales, of the most important works in the Salon of Paris. Partly from the *esprit de corps* which reigns among the French artists of all kinds, and partly from the smaller market value of copyrights there, they are enabled to command, with very rare exceptions, every work of most interest for their photographic albums, and these now form a record of the Salons quite unequalled for interest and completeness, enabling the stranger to follow the movement of modern French art at small cost, and forming the prettiest and most interesting of all drawing-room gift-books. This year, for the first time, something of the same kind has been ventured upon in England, the Fine Art Publishing Company (4, Rathbone Place) having produced an album of fifty-two photographs from this year's Academy. As a first year's essay the volume is highly creditable.

German photography in no way falls short of French in its work of reproducing and popularizing contemporary Teutonic art. Every picture that attracts attention in a German exhibition is speedily and admirably photographed, and disseminated, not only over Germany, but through France, England, and America, at a price which puts it within the reach of all, and in several sizes suited for the album, the portfolio, or the picture-frame. The Berlin Photographic Company is at the head of this good work, and their agent in London, Mr. Gerson, of Rathbone Place, has a vast and constantly-growing collection of their photographs from modern German pictures, which really are, as a rule, more attractive than the originals, for they give us all the artists' best qualities of subject, expression, and generally well studied composition and arrangement, while they mask the weak point of most German painters and schools—colour.

We are unable to say whether the peculiar beauty and singularly harmonious effect of both the French and German photographs from modern pictures are due to an understanding between painter and photographer, by which the painter makes a study in monochrome after his picture, from which the photographic negatives can be taken without sacrifice of the colouring. In some cases we know this is done, and it may go some way to account for the rare excellence of the photographs from French modern pictures published by Messrs. Goupil, and those from German pictures brought out by the Berlin Company. Something also may be due to the lower key of colour usually adopted both by French and German painters. But this reproduction of contemporary pictures is not the chief nor the most remarkable work undertaken by this enterprising German association. They have published, or are now publishing, photographs in various sizes directly taken from the masterpieces of the principle galleries of Europe. We have before us a portfolio containing their photographs on the largest scale from some of the finest examples of Raffaele, Holbein, Velasquez, Vandyke, Rembrandt, and other famous masters in the Dresden Gallery. They have done a similar work for the most famous pictures of the Pitti and Uffizi, the Louvre and the Berlin Museum, and our own National Gallery.

It is hard to understand by what means these enormous negatives are taken and printed from. They are evidently made direct from the picture, and in some cases seem of the same dimensions, or but little less. But a still greater wonder is with what a small sacrifice of colour the photographic copy has been taken. One part of the secret, we believe, is the high artistic skill of those who superintend the work, the patience and leisureliness with which the copying is conducted, and the facilities wisely given for it by the Directors of the Galleries. Whatever may be the means employed, the result is such as our readers, unless they have seen these Berlin prints, would imagine to be quite unattainable by any application of photography to the works of the old masters. What engraving of the beautiful *Maddonna di San Sisto*—though we have the masterpieces of men as famous as Muller, Steinhilber, and others to choose from—can stand comparison for a moment with this large Berlin photograph, which gives us, in one sheet, the head of the *Madonna with the Child*, in another the *Angels who wait upon the threshold*, in others the *Pope and the Santa Barbara*, of the same size as the originals, if our eyes do not deceive us, and bringing back to us the overpowering dignity and beauty of that masterpiece of its painter? So with Holbein's wonderful bust portrait, which bears the name of Hubert Morett, in the same gallery, and these most characteristic heads by Velasquez, Rembrandt, Rubens and Vandyke, including his finest portraits of Charles the First, and Henrietta Maria. Here is the very touch of the master—nay, the grain of his canvas, reproduced for us, with a fidelity that helps to recall, till it almost seems to replace the colour. Here are his lines, given with a precision that mocks the hand of the most

skillful and laborious engraver. Moreover, whereas the work of the latter reminds us, first of him, and only afterwards, of the master whose work he translates, here we are carried at once and irresistibly back to the picture, with no thought of the agency which so transports us. Some sacrifice of colour there may be, but the loss is insignificant in comparison with what we gain by this marvellous exactness and direct suggestion. But how, it may be asked, about the durability of these photographs? We are assured that it may be depended on; and we know that in the Autotype process there is assurance against fading.

What the Berlin Company have done for the gallery pictures of the old masters, the Chief German patentee of the Autotype process, Herr Braun, of Dornach, on the Rhine, has done for their drawings and frescoes, particularly for the great mural decorations of Michael Angelo, but these we have no space at present to describe.

(Standard, September 29th.)

Last night, in the Gallery of the Society of Painters in Water-colours, in Pall-mall East, the Photographic Society of Great Britain, which has for its president Mr. James Glaisher, held its annual exhibition. This year an experiment has been introduced in the hanging of the pictures, they now being distributed somewhat more in accordance with the subject and the style of picture, instead of all the subjects by one artist being hung together. The first picture taking the eye on entering the room is a life-size portrait of a lady, enlarge. by the carbon process by the Woodbury Printing Company, who have numerous samples of the perfection to which this branch of the art of photography has been brought. Amongst the enlargements are also many by Messrs. Spencer, Sawyer, Bird, and Co., by the Autotype process. There are numerous portraits that will excite attention, prominent amongst which are those of the Prince of Wales in Masonic costume (No. 86) by Marion and Co., and *Madame Patti* (No. 118) by J. E. Mayall. Photographs that will doubtless be viewed with much interest as those of the officers and crew of her Majesty's ships *Alert* and *Discovery* (the Arctic vessels), as containing portraits of men whose names will become historical in connection with the Arctic exploration. One of the most artistic and taking portraits in the exhibition is No. 17, by Hugo Thiele. There are also amongst the names of exhibitors those of Mr. Crawshaw, Captain Horatio Ross, and other amateurs; but prominent above everything for careful execution and attention to minor detail are the landscapes by the Royal Engineers who, under the able tuition of Captain Abney, have attained a rare excellence in this art. Two groups of heads of criminals taken from life will doubtless be a centre of attraction to those who care to study the facial characteristics of that class. Taking the exhibition as a whole there is the wherewithal to satisfy all classes, as it includes examples of every style and every process that the art of photography has yet developed. It may fairly be characterized as the most successful that the society has yet promoted.

(Daily News, Sept. 24)

This exhibition commenced yesterday evening with a conversation, at the Rooms of the Society of Painters in Water Colours, at which most of the prominent photographers in London, with many from the provinces, were present. It is unnecessary to say that the exhibition is a good one. For years past one has expected to find here the best work of the season, and the latest improvements in manipulation. Some very fine copies from pictures are shown; but of course the great body of exhibits may be divided into two classes, portraits and landscapes. Among the former many very beautiful works are shown. Mr. Hawke, of Plymouth, sends four really excellent cabinet portraits, which, for delicate shading and perfect management of tone, are unsurpassed by anything in the room. Mr. Valentine Blanchard sends an enlarged portrait of Signor Salvini, in which the expression of the great actor is very successfully retained. Messrs. Chaffin, of Yeovil; Messrs. W. and D. Downey, Mr. H. G. Cocking, and Mr. W. Bedford, all of London; Mr. J. M. Young, of Llandudno; and M. Thiele, of Dresden, also contribute some charming photographs. But it is in landscapes that the exhibition is strongest. Here, first among the first, is Mr. Wilson, of Aberdeen, with landscapes which it is impossible too highly to praise. One, a view of Balmoral, with the heather-clad hills behind, is the gem of the exhibition. But although his work deserves such high praise, there are other artists who are his equals. A group of tree sketches by the Royal Engineers; "A Way-side Bridge in Surrey," and "A Surrey Lane," by Messrs. A. and J. Bool; "A

Group of Trees, Leyton," by Mr. W. Brooks; a series of views at and near Cyfarthfa, by Mr. R. T. Crawshaw; "The Head of the Lake," by Mr. B. B. Turner; "An Oak," by Mr. E. Fox; and "Chiswick House," by Mr. W. Bedford, are a few among the many admirable photographs, certainly almost perfect in their beauty, which attract attention in walking round the room. Mr. R. Faulkner, of Kensington Gardens, sends a number of admirable portraits of children; and Messrs. Marion and Co., Messrs. Spencer, Sawyer, Bird, and Co., and the Woodbury Printing Company, show what beautiful pictures may be made by enlargement from an ordinary negative. The exhibition is well worth a visit from all who are interested in photography, or who care to see what the most assiduous students of the art have been able to produce by dint of the most careful and painstaking study.

Correspondence.

MR. JOHNSON'S DISCOVERIES IN CARBON PRINTING.

DEAR SIR,—I have read with attention your article of the 10th inst., and I find it written in a spirit of conciliation for which I thank you. Putting aside all subjects foreign to the matter in hand, I intend to prove to you that in the operation as described by Mr. Davies, the adherence between the albumen paper and the carbon tissue is due to atmospheric pressure, and not to the stickiness of the albumen.

Let us resume, in a few words, the process of Mr. Davies. The insulated carbon tissue is immersed in water for one minute, and brought in contact with a piece of albumen paper, which has previously been made wet, and laid on a glass plate, the gelatine being in contact with the albumen. The back of the paper is then rubbed or rolled so as to expel the air from between the two surfaces. The albumen is then made insoluble by applying alcohol to the back of the paper. After drying by the fire, or otherwise, the development is proceeded with. Now, you say that the adherence is caused by the sticky surface of the albumen paper, and not by atmospheric pressure, the piece of albumen paper not being an air-tight or impermeable surface, and that such a surface is necessary to secure atmospheric adhesion.

But it may happen that in immersing the albumen paper in water, all of the albumen will dissolve, and still the two papers will stick together, for the same reason that a piece of wet paper will stick to a glass; that is, atmospheric pressure. An evident proof is, that a piece of carbon tissue can be made to adhere to a sheet of ordinary, or even blotting paper, by passing it through the operation described by Mr. Davies. I enclose you samples which I defy you to detach.

The explanation is easy. Wet paper, whether it be ordinary or blotting-paper, is impermeable to the air. On the other hand, the gelatinized carbon tissue, which has been immersed in water for one minute only, has not absorbed more than one twentieth part of the water which it can absorb, and that quantity is only taken up by the surface. Brought in contact with a piece of wet paper, it continues to absorb water, produces a vacuum, and adheres. What proves this is, that the carbon tissue which has been immersed in water for a brief time becomes like covered with grease, the water being absorbed by the inner layers. If, on the contrary, the carbon tissue is left in the water (say for one hour), it becomes thick, the surface remains wet, and it is impossible to cause it to adhere to paper, glass, or any other surface, by merely bringing it in contact with it. To cause adherence, it is necessary to keep the two surfaces in close contact under strong pressure until the gelatine surface is partially dry, when it will be in the same condition as paper immersed for a short time. Experiments proving this can be repeated by any one. A piece of carbon tissue immersed in water for one minute will adhere to ordinary paper, to wood as well as glass, or to an impermeable surface. And it is not necessary that

the tissue be sensitized and insulated, for the conditions are identical whether the tissue be prepared or not.

In regard to the second period of the Davies process (the development) it can be proceeded with in various ways. The difficulty is in avoiding the air-bubbles, which, under the influence of the warm water, are expelled from the paper to which the tissue adheres, and in parts detach it. For this reason an impermeable surface is necessary between the paper and the tissue in order to prevent the air-bubbles from reaching the gelatine film. Mr. Davies obtained this conviction by making the albumen insoluble in applying alcohol to the back of the paper. When ordinary paper is used as a support, some kind of varnish is applied to the back. This varnish penetrates the paper, expelling the air, and, when dry, the image can be developed. The enclosed paper has been prepared that way. Mr. Despaquis had also understood the necessity for an impervious surface to develop upon, for speaking of the Marion process,* which only differs from the Davies process in that the tissue is left in the water one hour, and then applied to coagulated albumen paper under pressure, the following are the observations he made:—"In submitting to the action of steam or hot water the ordinary albumen paper used by M. Marion, this paper loses its sizing, and is apt to become impregnated with ink and colours in the parts of the proof which ought to remain white, and it is afterwards impossible to get rid of that colour, which stains the proof and causes it to be defective. It is necessary, then, to overcome this inconvenience to use an impermeable albumenized surface, such as tinfoil, porcelain, glass, mica, &c."

As I have remarked before, the insulated carbon tissue can also be immersed in water for a minute attached to ordinary paper, and hung up to dry partially. Then the back of the paper, which is used as the temporary support, is impregnated with dammar, or other varnish, and dried, after which the image is developed in the ordinary way.

Of all this results that all these processes are very similar. I have attempted to prove to you, that in supposing the adherence of the tissue to the albumen paper to be due to the thickness of the albumen you were in error, for the same thing takes place with ordinary paper made wet. Mr. Johnson has not discovered the process by atmospheric pressure, for Mr. Davis used it before him.†

I am willing to admit that Mr. Johnson has contributed to the progress of the carbon process by his publications; that he has made practical many things which were not so; but this is far from recognising him as the inventor of all the improvements to which he lays claim, and this opinion is shared by most of the competent authorities.

I have just received an authentic copy of another one of Mr. Johnson's patents, dated February 1874. In this patent Mr. Johnson claims as an invention the process which consists in recovering the carbon tissue before, or after, sensitizing with a film of collodion. Now, Fargier already did that in 1861, thirteen years before, and many others have done it since.

One would really think that Mr. Johnson had no knowledge of what had been done before him, for his patents which are exceedingly long, lay claim to a multitude of

* *Bulletin de la Société Française de Photographie*, 1868, Page 115.

† *Bulletin de la Société Française de Photographie*, 1868, Page 235.

‡ This is the original text of the Johnson patent:—"This improvement is based on the observation that if the support is impermeable to water, and the tissue be properly exposed, no adhesive substance is needed to ensure the necessary adherence to attach the tissue to its support during the development. It is only necessary in this case to expel the air from the moistened surface and from the tissue which has been unremoved by light. I produce this effect in wetting the tissue, laying it down on a metallic surface, sponging it, and rubbing the back so as to expel the air. It is the same which Mr. Davies does. His albumenized paper is impermeable to water, for the water does not filter through. Mr. Davies also wets the tissue, lays it on the albumen paper, and rubs the back so as to expel the air. These two processes are thus identical, for it cannot be claimed that the albumen causes the tissue to stick to the paper, as the same thing takes place when ordinary paper is used. All those who have come before Davies, and even some of the writers who have come after, leave the insoluble tissue in the water for one hour, then caused it to adhere to the support under pressure, and by interposing a cement or varnish, Mr. Davies first and Mr. Johnson after him, have done away with the press."

things, if they contain some things original, contain besides a great many more which were known before.

Now, in France, and, I believe, also in England, the law has foreseen such cases, and the court must decide on the validity, or invalidity, of the claims in them entirely, even if a patentee should lay claim to one or more real inventions; if one claim is made which cannot be sustained, the whole patent has to fall.

Now, the question cannot be doubted by any one who has read Mr. Johnson's patents, after having investigated what had been done before him.—I remain, my dear sir, yours very truly,
DR. VAN MONCKHOVEN.

SOUTH LONDON TECHNICAL MEETING.

DEAR SIR,—In answer to enquirers will you kindly permit me to state that the Technical Exhibition Meeting of the South London Photographic Society will take place at its usual monthly meeting, Thursday, November 11th., at seven o'clock.

Further particulars in due course; meantime communications may be addressed to me.—Yours faithfully,

EDWIN COCKING, Hon. Sec.

27, Queen's Road, Peckham

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

AN out-door meeting of this Society took place on Friday, October 1st, the scene of operation, being the mansion and grounds of Bonally, the residence of the late Lord Cockburn, and occupied by Professor Hodgson, of the Edinburgh University. Bonally, the outcome of the genius of Lord Cockburn, is situated at the foot of the Pentland Hills, within an easy distance from Edinburgh, and is, from a photographer's point of view, one of the finest places in the country. The house, Bonally Tower, as it is called, originally a simple farmhouse, was added to from time to time by Lord Cockburn as the exigencies of an increasing family required, the result being an imposing pile of Scottish baronial architecture of exquisite beauty, in perfect preservation, and surrounded with all that goes to make a perfect picture. The grounds, which extend a considerable way up the face of the hill, are laid out with great taste, and contain some fine specimens of rare pines, while ancient statuary, and sculptured vases are found here and there in just sufficient number to adorn, without detracting from the natural beauties of the scene. Nor is the charm of running water wanting. A stream comes down from the hills, and has been utilised with much taste. It has been made to flow through the grounds in various directions; here widening into a tiny lake, there crossed by an artistic bridge, and in various places the levels have been so adjusted so as to form pretty cascades, the whole forming, as we have already said, one of the most charming spots for the camera that is to be found in almost any part of the country.

The party left for Colinton Station, at 10.5, and walked from thence to Bonally, which they reached a little before eleven o'clock. The road from the station is bleak enough, and gives but little indication of the beauty of the place, but almost immediately on passing the entrance gate it bursts like a vision on the eye, and the spectator can hardly realize the fact that he has not been transported to fairy-land, so great is the contrast, here at least, between nature left to herself, and nature helped by the handiwork of an educated and cultivated taste. The cameras were at once unpacked, and all turned towards the perfect picture, which consisted of the main tower with its ivy covering in the centre, a foreground of well-kept and picturesquely arranged flower-beds, and to right and left some fine specimens of pines and cascades. The plates were beer and albumen and emulsion, and as long exposures were to be the order of the day, after the removal of the caps, a deputation was despatched to interview Professor Hodgson, and to seek permission, which, so far, had been taken for granted. Unfortunately the Professor was from home, but in response to the cards of the deputation, Mrs. Hodgson appeared, and gave the party a hearty welcome to roam about at will, and photograph whatever might attract their fancy, a permission which was taken advantage of to the full, the result being the production of numbers of excellent negatives, which, we have

no doubt, will be turned to account in some of the popular evenings which form so interesting a feature in the work of this Society.

Rarely do such meetings pass without some mishap occurring, and this one was no exception to the rule. One of the members, who seems to ignore all modern improvements in the shape of double slides or changing boxes, and who sticks to what he considers the good old method of changing his plates in a bag, came suddenly to grief in a way that will probably induce him to somewhat modify his opinion and practice. He had finished his work, and covered the plate-box with the changing-bag, or, rather, partly wrapped it into it, and by-and-bye forgetting it was there, attempted to lift the bag, when a rattle of glass was heard, and on turning round we saw his day's work scattered on the grass. The catch of the plate-box had got out, and, of course, every plate was spoiled. His face was a study that would have pleased, and could only have been done fully justice to, by a Rejlander. Being a bit of philosopher, however, his disappointment soon passed away and the only expression, made use of was, "Well, I always intended to have a lock put on that box, I suppose I must have it done now. It's a blessing I hadn't the large camera."

We have said that the exposures were intended to be, on this occasion, exceptionally long, the object being a twofold one: not so much to get many pictures as to make sure that what were got would be really good; and, secondly, to give plenty of time for the full enjoyment of a day out in the open air; and, on the grass, on a glorious autumn day, to, in point of fact, try the recommendation so kindly, although somewhat indirectly, given by their friend Mr. A. W. Steele, of Leith, to "rest their weary eyes on nature's greenery, and enjoy, on a heathery knoll, the soft recumbency of outstretched limbs;" and this they did to the fullest extent, not forgetting to bless the man who had thus shown them the true way to enjoy the beauties of nature in the combination of work and pleasure.

Early in the afternoon the party proceeded to Colinton village, where some plates were exposed, and much kindness shown by Mr. Burton, the celebrated engraver, into whose garden they had gone, and without, of course, knowing to whom it belonged. He had wrought the Daguerreotype in the early days of photography, and showed them a fine collection of specimens of that style—the most beautiful of all processes—as well as his collection of pictures and curiosities, and sent them on their way rejoicing. From Colinton they worked their way down to Slateford, in the Caledonian Inn of which they wound up the proceedings of the day with a first-rate tea, to which they all did full justice.

While tea was being prepared, an ordinary meeting was constituted; but as another was to be held in the usual place of meeting on the 6th inst., no business was done; and, after tea, they took the train for Edinburgh, where they arrived about 6.30, highly pleased with the proceedings of the day.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held on Tuesday evening, the 28th ult., at the Free Library,—the Rev. J. D. RILEY, President, in the chair.

The minutes of the previous meeting were read and passed.

Mr. J. A. FORREST feelingly alluded to the loss the Society had sustained owing to the death of one of their oldest members, Mr. Robert Cooke.

Prints and negatives were exhibited by the Rev. H. J. Palmer, Mr. Forrest, Mr. Castellain, and the Secretary. Those of Mr. Palmer were views of the interior of St. George's Hall, Liverpool, taken on gelatino-pellicle plates with an exposure of about seven minutes, giving the most perfect detail even in the deepest shadows.

THE SECRETARY strongly recommended the use of these plates for taking figures or groups in a landscape, as it was much more pleasing to return home with some views in which were depicted the likenesses of friends and companions. The short exposure required—being only a few seconds with a view lens—greatly lessened the risk of the figures moving while being taken, and the pictures were rendered doubly interesting and valuable.

It was arranged that a sub-committee, consisting of the officers of the Society, with Messrs. Forrest and Phipps, should decide on the choice of a presentation print for 1875.

It was proposed and carried that at the next November meeting each member would be expected to produce specimens of his work during the past season.

A subscription was announced for the benefit of the widow of the late John Glover. Mr. J. A. Forrest, who is treasurer to the

fund, informed the member of the long and dangerous illness of Mrs. Glover, who, besides being powerless to do anything for herself, necessitates the attention of her family. Mr. Glover was one of the founders of this Society, and for some time its secretary. The late Mr. Glover was one of the most energetic workers in the art, inspiring others to enter and further the advancement of amateur photography. He (Mr. Forrest) was sure that in remembrance of their old friend, and in so good a cause he would not have to appeal to the members for their assistance in vain.

The meeting was shortly afterwards adjourned.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The first meeting of this Society for the winter session will take place at the rooms of the Society of Arts, Adelphi, on Thursday next, October 14th, when papers will be read by Mr. S. Fry, and by Mr. H. Vander Weyde on his new studio window.

WET PLATE PHOTOGRAPHY AT CAPE MAY.—When it rains here, and, I am grieved to say, it does so just as often as elsewhere, we have two methods of diverting ourselves—we sit in the hall and listen to the band which plays the "Mulligan Guards" with extraordinary depth of feeling and nicety of shading, or we sit on the piazza and are photographed *en bloc*. The artist aims his artillery at his victims from a balcony on the second floor, and makes a little preparatory speech before he lets fly. He amiably suggests changes of position; that the gentleman with the red hair should take a seat right in front, with one of the children on his knee; that the lady in the white dress should take the central chair, and lean back with head turned considerably around, as if looking back after some one. Here there is interruption from a gentleman who states that he wishes to get into the focus of that some one, that the bright eyes may be fixed on him. [Titter from the ladies and snigger from the boys, who murmur *sotto voce*, "Shoot that flat."] The artist deprecates this lack of seriousness, and suggests that this is an important business and no laughing matter. I, who am below the balcony and facing the objects, quite agree with him, for everybody who is posing has assumed a stoniness of aspect which is petrifying. One would think they had forgot to breathe, and that they had been suddenly bereft of their souls. Every atom of expression has been wiped out as if a magic sponge had been passed over their features. "Remain like that," yells the artist, when the stoniness has reached its climax of intensity. He rushes frantically from the balcony, reappears with a slide, fidgets with the top of his photographic gun, drops it, removes the cloth, gazes anxiously at his victims while one might count thirty, makes a ducking kind of bow, with the remark, "That will do, ladies and gentlemen," peers keenly at the withdrawn negative, and reappears next morning to sell the positives at fifty cents apiece.—*New York Times*.

To Correspondents.

*** Owing to the pressure upon our space, resulting from placing the various press notices of the exhibition before our readers, we are obliged to postpone our own further notice until next week.

EVENING DRESS AT THE PHOTOGRAPHIC EXHIBITION.—We have received several letters on this subject; but as no purpose can be served by an extended discussion on an event which is past, we cannot afford space to give them at length. "A Former Member of the Council" protests against the letter of Mr. Werge, as lowering to the status of photographers, and the allusion to the evening dress of ladies as "semi-indecent" he regards as "coarse and insulting to all ladies," and "simply unpardonable." The letter generally, he thinks, indicates that Mr. Werge can know nothing of the practice of other learned societies, who invariably require evening dress at their *conversations*. "An Assistant Operator" writes to thank Mr. Werge for his bold and vigorous protest against an act on the part of the council which effectually shut him and some hundreds of other operators from the pleasant reunion of the opening night of the exhibition. After some preliminary remarks, he says:—"I am an assistant operator in a small establishment, my employer doing the principal operating work in the glass room, whilst the dark-room work is entirely in my hands. My wages are thirty-five shillings, and I have a wife and two children; and whilst, by care and economy, I always contrive

to have a suit of clothes better than those worn on working days, I will leave you to judge whether it is likely I can afford to keep a suit of what is termed in society evening dress; and if I could afford it, what possible use could I have for it? When could I with propriety wear it? Yet I had set my heart on attending that opening of the exhibition. I had taken great pride in assisting in producing the specimens we sent in; and I had promised my wife she should go too, as, like a good wife, she is interested in her husband's occupation. It may be said that we could have gone in such clothes as we had. Whether we should have been admitted or not I do not know, but if we had I know that we should have felt humiliated, and have been like guests without wedding garments, and have been singled out by our attire as belonging to a lower grade of society. A protest from a gentleman like Mr. Werge, whose name and position are known, will, I hope, have some weight in preventing a recurrence of the same error." J. B. R. first asks "What is evening dress?" and then proceeds to make merry with what he terms "claw-hammer coats" and "shiny black cloth bags," finally asking by what right the council undertake to dictate to the members how they shall dress when going to the opening of one of their own exhibitions? "Old Amateur" suggests that Mr. Werge must have obtained his ideas of the evening dress of English ladies and gentlemen from some burlesque writer, and not from actual observation of the practice of society. He adds:—"The learned societies of London may be unhesitatingly said to consist of, or include, the ablest leaders of thought, the most earnest pioneers of science, and the most noble exponents of art, and these gentlemen who conform to the custom which has made a certain ceremonious style of attire the rule on ceremonial occasions like the *soirees*, are practically included in the stigma of sanctioning folly in men and semi-indecency in women." Some other letters refer to the subject, which it is not necessary to quote. We can simply repeat what we have already said, that, on due consideration, we think it will be seen that the opening of the photographic exhibition is, in many respects, essentially different from the recognized *conversations*, and that an informal friendly reunion, without any sartorial conditions beyond those prompted by the good taste and right feeling of visitors, best meets the requirements of the case. Such a plan will no doubt be adopted in future.

A. NOEL.—There are several modes of photographing on wood for engraving. Much depends upon the process with which you are familiar, as to which will best suit your purpose. Assuming that you are familiar with the operations, the best plan is to produce an image in chromated gelatine, and ink it up precisely as if it were to be used for producing a lithographic transfer. The image in greasy ink is to be transferred to the surface of the wood. This is the best method, because it requires no fixing, no wetting of the wood, and interposes no film on its surface. Another good plan consists in producing a collodion transparency, toning it with platinum, transferring the film to the wood, face downwards, and then dissolving the collodion so as to leave only the black platinum image. Another plan consists in using collodion-chloride, or the *Wothlytype* process, in each case using a powdery collodion, coating the surface of the wood, printing deep, and dissolving off the collodion, a sufficient image being generally found imprinted on the wood.

HOPE.—The appearance of a deposit of metallic silver in the shadows of the negative generally indicates two or three things—namely, that the plates are imperfectly cleaned, or that they are damp at the time of coating with collodion, and that there is slight under-exposure and over prolonged development. If the dark-room be not well ventilated, its atmosphere often gets surcharged with moisture, which condenses on the plate, and is a prolific cause of the trouble in question.

G. L. M.—Members, and visitors introduced by members, are admitted free. The charge to the public for admission is one shilling each person.

JUVENIA.—Collodion for enamelling prints should, when dry, leave a perfectly transparent film, without any opaqueness or opalescence. You can test it by allowing a film to dry on a plate of glass. If it in any degree dim the transparency of the glass, it will in an equal degree lower the tone of the print.

D. L.—You may reproduce statuary perfectly well with a single lens. The ordinary wet collodion process answers well. A weak iron developer in preference to a strong one.

Several Correspondents in our next

PHOTOGRAPHS REGISTERED.

Mr. T. GRAINGER, West Hartlepool,
Photograph from Painting, of Robin Hood's Bay.

Mr. J. CAMLIN, Ballymena,
Photographic Group of Orange Emblems, called "Bally-kilbeg Star."

Mr. GRAYSON, Luton, Beds.,
Photographic Group of Rev. J. W. Genders, Mrs. Genders, and their daughter.

Two Photographs of Rev. George Smith.

The Photographic News, October 15, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

YELLOWNESS IN SILVER PRINTS—PHOTOGRAPHIC ENLARGEMENTS.

Yellowness in Silver Prints.—At the West End, in the vicinity of Pall Mall, there is to be found a House Agency where photography is largely employed for the depiction of "eligible residences to be let or sold," and the pictures which are exhibited in the windows to public gaze bear melancholy witness to the untrustworthiness of silver prints. There are possibly a hundred exhibited in all, and of these, fully one-half—we might almost say two-thirds—show ravages of that deadly disease, "yellow fever." Truly, photographers have no worse enemy than this sickly pallor which gradually overpreads their works, and against which there is no remedy when once it makes its appearance. There is no reason to suppose that the photographs we allude to have been more carelessly produced than the majority of silver prints, for many of them prove that some skill has been displayed in the way in which the camera has been placed, and the best aspects of a house and grounds have been chosen. If they have been produced by a photographer in the ordinary course of business, as is most probably the case, he would have no reason for scamping the fixing and washing of these prints, any more than that of others under his hands, and they represent, therefore, we do not doubt, specimens of ordinary work, in which no special or extraordinary precautions have been taken to free them from the last traces of soluble compounds that may be contained in them. But the change that has come over the prints has been more rapid, and much more marked, from the circumstance that they have been exposed to full sunlight for days and months together, subject to the glaring action of the sun for hours and hours. It is impossible to look upon this collection without feeling that photographers can never regard their works to be safe unless they are printed by some more permanent process, or until some decided modification is made in the silver printing method as at present practised. Dr. Vogel has recently resorted to the subject, and has once more urged photographers to test their pictures, after coming out of the final washing bath, for hyposulphite. The washing of photographs, after fixing, he avers, is very unsatisfactorily carried out in many studios, where, even if the pictures are put into the bath separately, they are allowed to clog and stick together afterwards, during the whole period of the rinsing process. To separate them every now and then is worth far more than continuing the washing operation beyond the usual period. But fading or yellowness in silver prints is not alone due, as every practical photographer knows, to the imperfect washing of prints, for many have proved that a most carefully washed print will fade at times. That imperfect washing is one of the causes, and possibly the most frequent one, we will not deny, but there can scarcely be a doubt in most minds that fading is frequently caused by the existence of an insoluble compound formed in the albumen, which subsequently changes colour. Dr. Gayer, while admitting this, brought forward some time ago, our readers remember, a method to obviate the formation of such a compound, his *modus operandi* being to employ a fixing solution of very great strength, and only treating one or two prints in the same bath, the photographs being fixed in the dark. Any compounds then formed were, he stated, perfectly soluble, and could be dissolved out afterwards, so that if recourse was had subsequently to a perfect washing of the prints, no fear need be entertained of the photographs fading. We do not know whether Dr. Gayer has found any number of disciples to follow him in his rather expensive and laborious method; but if such prints could invariably be ensured by it as those he exhibited, and which had been subjected continually to the effects of an Indian sun for ten or a dozen years, there should be no hesitation whatever in taking up his suggestion. The idea of separating the

sulphur from the white of egg employed in albumenising paper, which was mooted a few years ago, remains but an idea still, unfortunately, for here was another chance of getting rid of one of the defects of silver printing seemingly inherent to the process. That something must be done, and that quickly, if we are not to abandon silver photographs to a great extent, must be apparent to all, for although there are many who pledge their belief in the stability of silver pictures when properly prepared, it would puzzle most of us to say what is the plan to adopt to secure infallible albumenized prints. It will never do to give up altogether so beautiful and delicate a process as silver printing, and it is simply nonsense to talk about its rapid disuse during the last few years, for there is not a single photographer of note in this country—nor, we believe, in any other—who has discontinued the process entirely. The public are, however, getting more and more alive to the instability of silver photographs, and have of late grown very chary about investing their money in large albumenized prints, especially which are given to fading; and people who do not mind giving five guineas for an engraving hesitate about disbursing as many shillings for a photograph, which may turn yellow after being framed a twelvemonth.

Photographic Enlargement.—With the public it is a general belief that a photograph should always be inspected at very close quarters, and, if possible, with a magnifier. Now, although there can be not the least objection to such critical examination in the case of small and finely executed pictures, it is rather hard to have one's work thus sharply inspected when on a large scale. Many people objected to the large direct portraits for the Crawhay competition, some of which were really very fine pictures, because you saw too much of the wrinkles and of the imperfections in the skin; the same objections being loudly uttered against enlargements. People never think of looking at portraits in this way. One never sees visitors at the Royal Academy, for instance, with their noses against the canvas, or rubbing the varnish with a magnifier; they know very well that at close quarters they only get an unpleasant view of the brush marks, and that the rough patches of colour are quite meaningless under such circumstances. Why, then, should not photographic portraits on the same scale be permitted to remain at some distance also? Why should critics find fault with enlargements which fulfil their object at a few paces distance, and which are only found to be defective in detail when critically examined *de près*? It is only the most exquisite little painting that can bear close inspection; and similarly, it is only photographs on a small scale that should be so viewed. This is especially apparent in the case of the enlargements of some of Rejlander's fine studies which are exhibited at the present Exhibition in Pall Mall. We allude to "At the Play" and "Coming from the Fair," both of which are charming pictures seen in a subdued light, and at a little distance off; but, hung as at present, in the brightest portion of the room, and on the line, too, so that the spectator, in making the round of the room, keeping pretty close to the walls to see the small pictures on either side, looks at them at close quarters, they must inevitably be pronounced coarse and blotchy in execution. Even if the visitor goes out of his way in his round, and steps back some yards, justice is scarcely done to the pictures, for, we repeat, there is far too much light for them. As they are at present placed, they will, unfortunately, only go to confirm the popular idea that photographic enlargements are always coarse and ill-executed, and that a large amount of painting and covering up of defects is absolutely necessary before pictures of the kind are in any way presentable.

PHOTOGRAPHIC ETCHING ON GLASS.

BY W. H. DAVIES.*

This was the subject of a paragraph, and not a short one, in the columns of the *Daily Scotsman* a few weeks ago, in

Read before the Edinburgh Photographic Society.

which paragraph certain claims were made which require examination. The paragraph was as follows:—

Etching on Glass.—We have just had an opportunity of inspecting some views of old Edinburgh, produced by Messrs. J. Malloch and Co., Lawnmarket, by means of a method of etching on glass which that firm may, we believe, claim the credit of contriving. The object of this simple but ingenious process is to provide the draughtsman with a surface which shall at once admit of the utmost freedom of hand, and receive and retain the slightest and sharpest touches of the etching-point. A sheet of perfectly smooth plate glass is covered with a preparation which, when dried, has all the appearance of a coat of yellowish oil paint, only that it possesses considerable translucency. The pigment seems to adhere firmly to the glass, but, at the same time, is capable of being easily removed by a needle point, so as to leave the glass exposed in perfectly clean cut lines. Working on the surface much as he would do on the wax coating of the copper-plate, but with the additional advantage that he can readily judge of the effect of his touches by ever and anon placing the glass against a dark background, the etcher makes his drawing. This having been completed, a process of photo-lithography is resorted to for the purpose of reproducing it on paper; and, from specimens before us, we can testify to the transference being effected with remarkable sharpness and precision. The prints, in fact, might very easily be mistaken for impressions of etching on copper, reproducing as they do, with the utmost clearness of definition, every line and dot of the original drawing. The advantage to artists of such a medium as the pigment-covered glass seems too obvious to call for remark. Without the necessity of mastering a difficult technical process, he has here a means of expressing himself with perfect ease and freedom; and that, too, it would seem, with the certainty of his work being reproduced in exact duplicates. The method seems also well worthy of the attention of amateur draughtsmen, who may not care to face the practical difficulties of copper-plate etching or wood engraving."

You will see from this that the claim is made by the writer for Messrs. Malloch and Co. of inventing or contriving the method of etching on glass, which is expressly brought forward as new. Now, the narrative of the facts in the case is something like this.

Our esteemed fellow-member, Norman Macbeth, A.R.S.A., brought before the Society a method different in detail, but not in practice, from that which had been in use for many years and by many persons (originated I know not how, but never put to much use), of etching or drawing with the point on a film of collodion, and intensifying with silver till it had become quite opaque and black when looked through. Thereafter, by etching through this ground, and having a white surface below, the artist was enabled to produce, by the use of an etching needle, or a hard steel pen, or other instrument, an etching on the plate, which was in this way transformed into a negative or plate similar to a copper or steel plate, but capable of being printed from as a photograph.

One of the drawbacks in the process was the dark colour of the etching ground, which prevented the progress of the work being easily seen. On this being made known, I suggested that it would be possible to work with a white ground by taking an ordinary dry plate, prepared with a substratum of albumen, without the after addition of exposure to light and intensification with silver. After the etching had been completed on the dry plate, it was then to be treated with Schlippe's salt, in a weak solution, which at once would convert the etching into a strong printing negative, fit for any purpose, and after a few trials, perfect examples were got and exhibited before this Society by Mr. Macbeth and by myself. I should state that the gentleman mentioned in the paragraph was present at these meetings, and at them showed some very rude sketches with the point on *smoked glass*, believing he

had in that made a great discovery; and when informed that Dr. Strethell Wright had made many of his most perfect microscopic drawings in this way, he seemed not only much annoyed, but actually to doubt or misbelieve his informants, although these drawings, as lantern slides, had been shown to this and other societies long before; several of them, the Volvox Globator and others, being of the highest order of merit. Such being the case, I cannot allow this claim to be made without entering my protest against it. It may be said that in all that has been advanced, nothing has been said of *photo-lithography*; but this is precisely one of the applications which the idea or method, when published, was stated to be applicable to. Every one who has experimented in the direction knows—and it has been stated here, and published from here, probably as early as from any other source—that the *sine qua non* of a good photo lithographic negative was absolute clearness of the transparent parts, with the nearest approach to absolute opacity in the dark, which, when reversed on the lithographic stone, gives pure blacks and whites. The method of etching or drawing on a dried plate gives this in the highest degree, and so makes the best negative fitted for photo-lithography. The necessary work of making transfers and putting to press being only part of many previously published methods of doing this, which no one can now claim, more especially after the works of Ramage, Osborne, Sir Henry James, and others of a dozen years ago, and the explicit formulæ which have been published in such profusion; not to mention the practical exemplification of the whole art, which I brought before this Society in this very room a dozen years ago at least, are not such as any one can now claim, or allow to be claimed for them, without at least allowing for the credit due to those who have gone before.

I do not wish to determine who first etched on a dried collodion plate, but I can state that Mr. Charles Edward Johnson, now of London, did a sketch of an old seventy-four war-ship in my presence, while he was resident in this city more than twelve years ago, and where he has not resided since. Whoever was the originator of etching on glass, I know it was not the persons named in the paragraph I have quoted. At the same time, I have no doubt the perfecting and bringing this little method before the public is due to either Mr. Norman Macbeth, or his equally clever son Mr. Robert Macbeth, specimens of whose works, as shown first at this Society, I now again show after an interval of some years.

One more word and I have done. Artists have singularly neglected this admirable method of transmitting their thoughts and ideas to others, and if Messrs. Malloch will be content with the credit of again calling attention to this really cheap, facile, and handy mode of reproducing the direct work of the artist's hand, the penny-a-liner's work will not have been misplaced; but if they allow the invention, or inception, or conception of the idea to be attributed to them, then we must adopt this or some stronger method of stating that *it is not so*.

One more suggestion, and I have done. Schlippe's salt is, for this purpose, useful enough, if used weak and newly made up, or reduced sufficiently with water; but a much more effectual intensifier is to be found in a solution of tannin used in this way, or these ways—either. Prepare the plate as for a dry plate, and do not wash away the adhered silver completely, but leave just sufficient to become coloured by the application of the tannin. After the etching is complete, then wet thoroughly, and give a wash with a six-grain solution of tannin, and wash. Or take this other method. After washing thoroughly, then drying, then etching, then wetting again, flow over with a twelve-grain solution of silver, and soaking the film; then wash and treat with the above solution of tannin, and you have a r
darks, and clear i

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XXI.

DEFECTS IN THE PRINT—CAUSES OF FAILURE IN THE PRINTING OR POSITIVE PROCESS.

(a) SOMETIMES there is cause for complaint, though not so often as photographers would wish to believe, in the commercial albumenized paper. These faults may generally be detected on examination of the paper.

(1) *Unequal albumenizing* will be seen by the prints made on different parts of the same sheets exposed under one negative, some being brilliant, where the albumen is thickest, and others, from the thinner albumen surface, being dull and lustreless.

(2) *Dry and horny paper* should be kept in a cool, damp place, and not exposed to warmth before sensitizing.

(3) *Tear drops* are often the evidences of above fault. To save the paper on which they appear, blot them off. Drawing the paper over the glass rod fixed to the sensitizing dish will, in a measure, remedy it.

(4) *Albumen spots and streaks* are caused by carelessness in albumenizing the paper, the spots being spattered on the sheet while drying, and the streaks marking the course of little rills running down the paper in drying.

(5) *Metallic spots* are sometimes caused in the drying-room of the albumenizer, and as often in that of the printer, from the rust of the stove, &c., a slight speck of iron rust spreading considerably.

(b) Failures in the bath and in sensitizing the paper.

(1) *White spots on the paper* indicate the presence of air-bubbles on the bath under the paper. Lift up the corners of the paper when on the bath, and break the bubbles with a glass rod.

(2) *The solution adheres in drops*—the "tear drops" mentioned above. Those should be blotted up with clean blotting-paper. Keep the albumenized paper in a cool place.

(3) *The paper repels the bath* because the albumen is too dry—perhaps the effect of hot weather, and not the fault of the paper. Keep it in a cool room.

(4) *Greyish scum on the paper* is taken up from the bath. It may be seen on the surface of the bath before silvering, and should be removed by drawing blotting paper over its surface, or by filtration.

(5) *Rapid discolouration of the paper*; generally caused by too long floating on the bath.

(6) *Sunk-in, dull appearance of prints*, from the same cause.

(7) *Bronzing of the shadows*; also the effect of too long silvering.

(8) *Weak, flat pictures*, without boldness and relief—the effect of too short silvering, or impoverished bath.

(9) *Red spots and red printing*, often from the same causes. Sometimes, however, this, and the previous failure of weakness, may be caused by not properly drying before and after fuming.

(10) "*Greasiness*" of paper after silvering; either from being too dry before floating, or not sensitized long enough. Perhaps the bath is too cold.

(11) *Paper on the bath curls back* because it is too dry. Gently breathe on it until it flattens, and see that the other sheets are kept in a cool place before silvering.

(12) *Inequality of prints* is caused by uneven silvering.

(13) *Stains on the paper after silvering*, and during the drying, come from dirty places against which the damp paper has been brushed.

(14) *Dark stains to the back of the paper* show where the solution has run over the paper.

(15) *The bath turns brown*. This may be remedied by the addition of permanganate of potash, exposure to light, and filtration. It is caused by the dissolution of the

albumen from the surface of the paper. Test your bath, and you will probably find it very weak. Strengthen it.

(c) Failures in drying the paper.

(1) *The paper curls*. Weight it down as described in chapter xviii.

(2) *Tear drops show in the drying*. Blot them up with bibulous paper.

(3) *Stains*, similar to No. 14, above, are caused by the sheets swinging together under the influence of draught.

(4) *Numerous failures* are caused by imperfect drying, weakness and inequality in printing, and, when the paper is damp, danger of its sticking to the negative.

(d) Failures in fuming.

(1) *Insufficient fuming*, either from weakness of the ammonia, or short time of fuming. Red, flat, and weak prints are the result.

(2) *Over fuming* produces prints blue and cold, and sometimes with a metallic appearance.

(3) *Unequal fuming* and unequal prints go together.

(e) Failures in cutting the paper for printing.

(1) *Waste and bad cutting*, the result of carelessness or ignorance.

(2) *Stains and dirty paper*. Caused by dirty fingers, paper-knife, or shears; or from laying the paper on a dirty place, table, drawer, frames, &c.

(f) Failures in printing.

(1) *Breakage of the negative*. Generally carelessness. Sometimes from warped frames (discard such), flaws in the glass, bad cutting, curvature in the negative, &c., &c.

(2) *Little white spots in the print* are caused by dust between the negative and the paper. Brush the negative on putting into the frame each piece of paper.

(3) *Blurred prints* are caused by unequal contact; perhaps in using too large a piece of paper for the frame, or, generally, by insufficient pressure.

(4) *Double outline*. Carelessness in opening the frame for examination of the print, and in closing it after, causing the shifting of the print. Perhaps the frame is not firm, or imperfectly closed.

(5) *Unequal sharpness of the print* is the result of not placing the back of the frame in position, or from the inequality of the pad.

(6) *Unevenly-printed shadows*. Generally caused by printing negatives much retouched in the shadows, in too strong light.

(7) *Harsh vignetting*. From inexperienced cutting of the form, or fixing it too near the negative. Too strong light in which it is printed often causes the defect.

(8) *Ill-shaped vignettes*. From ill-shaped forms, or from the light creeping in on one side.

(9) *Badly-shaped medallions*. Perhaps the cut-outs and masks are badly cut, or, most likely, improperly used. Carelessness in handling the forms; they are often torn and worn out of shape.

(10) *Ugly fancy printing*. The result of want of taste. Keep to plain printing.

(11) *Failure in greying the vignette*. Too strong light and want of skill or judgment. The grey should never be darker than the vignettted background of the original print. Do not attempt the "in memoriam" effect of getting a black background with a light halo round the head. Nothing can be worse—even as a novelty.

(12) *With printed-in backgrounds* the dangers are numerous, and failure easy. Moving the background out of position, the injudiciousness of choice, too great sharpness, and printing over the figure, are a few of the faults in a manipulation that requires great care, skill, and taste.

(13) *Finger-marks on the print*. From touching it with soiled fingers.

(14) *Weak lights* are often caused by examining the prints too often during printing, or in too strong light.

(g) Failures in washing the prints before toning.
(1) *Stains* from water splashes while placing them in the washing dish.

(2) *Imperfect washing*, in allowing them to stick together, and not keeping them in motion.

(h) Failures in toning.

(1) *Too rapid action of the toning bath* is caused by too great addition of chloride of gold. To this may be laid several faults, as—

(2) *Over-toning*, the action of the bath being so rapid that the toning cannot be checked at the right time. This fault may also, of course, be due to inexperience or unwatchfulness.

(3) *Uneven toning* is another result of using too strong a bath. Generally, however, it is caused by the prints being allowed to stick together while in the toning bath—the prints should be kept in constant motion, to allow of the solution gaining access equally to all parts of the prints—and, not unfrequently, from a bad habit indulged in by some printers of strengthening the bath during the operation of toning.

(4) *Weakness of tone* may also arise from the bath being too strong, or the prints being originally weak, the strength of the toning bath increasing the defect.

(5) *Mechanical or inartistic toning* evidences a want of care or thought on the part of the operator. A batch of prints diverse in style and quality, some requiring special treatment, are all toned alike, and therefore faultily, however good and even the tone may be.

(6) *The prints refuse to tone*. Several causes lead to this result. The paper sensitized on a bath manufactured from an old negative bath in which there is much iodide of silver, acid, or foreign substances, will often quite fail in the toning.

(6a) The water of the toning bath is contaminated with sulphur, or perhaps the dish is not clean.

(6b) Gold solution is wanting.

(6c) The solution is too cold.

(i) Failures in fixing.

(1) *Stains and streaks* in the prints are formed when they are not immersed equally in the solution.

(2) *Spots and splashes of hypo and finger stains*, in placing them in the fixing dish, should be guarded against. If you cannot safely accomplish it alone, an assistant should drop the prints on the dish while you place them under the solution, and keep them in motion.

(3) *Yellow spots*, which may not appear until the prints are finished, are from air-bubbles, which prevented the action of the hyposulphite of soda. Constant agitation of the prints in the bath will effectually break up these bubbles.

(4) *The prints turn yellow*. Cause: an old fixing bath.

(5) *Cloudiness of the prints*, markings which afterwards turn yellow: caused by imperfect fixation. The prints were in the bath too short a time, or not enough solution was used.

(k) Failures in washing after fixing.

(1) *The prints spot and blister* on being placed in water. To avoid this, gradually reduce the strength of the hypo solution—when the prints are all fixed—until it is almost free from soda, that the change to the prints may not be so rapid; then wash in water, and so on, as directed for washing the prints.

(2) *The prints turn yellow* in consequence of traces of hypo being left in them, either because they stick together in washing, or from

(3) *Insufficient washing*, the cause of fading in photographs. Keep the prints separated.

(l) Failures in finishing.

(1) *Yellow spots* are sometimes caused by using old blotting pads in which are traces of hyposulphite of soda.

(2) *Spots are also caused by using mounts containing traces of soda or sulphur.*

(3) *Stains* appear when old, sour starch has been used for mounting.

(4) *Spots and stains* often result from placing together a number of damp mounted pictures.

(5) *Ridges in rolling the prints*, scratches from dust in the roller, breaking the edges of the card, marks of stoppage, &c., may all be avoided by care.

(6) *Numerous defects* in spotting out the prints are to be avoided.

THE PRACTICAL PRINTER IN AMERICA.

XLI.

FIXING THE PORCELAIN.

THE porcelain, when toned, and the toning washed off the plate, is then to be fixed as you would do with a paper print, viz., with a weak solution of hyposulphite of soda.

The strength of the hypo is generally weaker than is used for fixing paper prints, and a little thinking by the beginner will enable him at once to see that it is not required to be as strong.

In the case of the paper print, the silver often sinks far into the albumen, and when the paper has been floated too long a time, say four or five minutes, as has been recommended by some, the silver often sinks through and into the bibulous paper beneath the albumen.

When a paper print is placed in the fixing bath, a stronger solution is required than what would suffice for the fixing of a porcelain, because it has got to penetrate through the mere surface of the albumen, and far into it on one side; and through the back of the paper to the albumen, and also a little into that on the other, and there do its work, which it will thoroughly do if the prints are moved about sufficiently, and are permitted to remain in the bath long enough. It is not an easy thing for the hypo solution to penetrate into the albumen anyhow, but it is done much better with a weak solution and a longer time of fixing, than it is with a strong solution and a shorter time for fixing. The albumen is a substance that is not the easiest thing in the world to wet with water, yet if the temperature of the water is bloodwarm it will, in a short time, penetrate quite a way into the paper, at least as far as the silver solution penetrated during the sensitizing of it.

Now, in the case of the porcelain print, all of the penetrating of the solution is done on one side of the porcelain, and through something that is more easily penetrated through than what albumen is, and a considerably weaker solution is used in this case, as has before been said; and as regards the tone, it is much better than it would be if a stronger solution than what is recommended below were to be used.

You might say that we can use a stronger solution and fix quicker, but as sure as you do it, the tone will be spoiled, and bleaching will be the result. Make up the bath as follows:—

Sat. sol. hyposulphite of soda	... 1 ounce
Clean rain-water	... 12 ounces
Sat. sol. bicarbonate of soda	... $\frac{1}{2}$ ounce

Fix in a weak light, but not quite so weak as was recommended in the toning; fix five minutes, or until the face of the porcelain turns clear in tone, after the hypo has once turned it cloudy, which it will do the moment the print is placed in the bath.

The porcelain print undergoes a variety of changes in the fixing bath, often immediately turning a peculiar green, as disagreeable in looks as it is peculiar, and the longer the plate is kept in the bath, the worse it seems to look. Then, again, it turns yellow, and stays so too, which is often a sure sign of under toning, and if 'e-blue or a forced brown colour, then this is o' of over-ton'

To tell when a porcelain is fixed you should permit it to remain in the fixing bath until the tone to which you have toned it returns, and then, if, on close examination, the face is seen to be clear, the plate is fixed; if it is not clear, let it remain in the bath until it is.

FINAL WASHING OF THE PORCELAIN.

The porcelain when fixed is then to receive the final washing, which will render the plate free from any destroying agent that will cause the print to fade, at least so far as anything besides the plate itself is concerned. For the first few minutes the plate is carefully washed on both sides under the tap. Rub the back of the plate with one hand, holding it with the other, and permitting the water from the tap to fall not too heavily on the face of it.

Set the plate under the tap (say, for instance, on one end of an empty salt box), and let a steady stream of water fall upon it, moving it at times, so that the water will fall at a different place every five minutes.

After the plate has washed half an hour or so, then soaking the plate in a salt-water bath, made as below given, is an excellent thing.

Lukewarm water ...	...	...	1 gallon
Chloride of sodium (table salt) in weight...	...	...	2 ounces

This warm salt-water bath will enter right into the film, and displace within five minutes all of the hypo that is left in the film after the washing just described.

Let the plate remain in this bath five or ten minutes, and then soak it in two more lukewarm water baths, but let these baths be of fresh water. Give the plate a quick final washing under the tap, and rinse will.

During the first washing of the plate, the tone of the print often changes, which will be fully entered into subsequently.

DRYING AND TINTING THE PORCELAIN.

Drying.—The plate can either be dried spontaneously, or by artificial heat, as the printer chooses. Each of these is best at times, as any one who has ever printed porcelain pictures knows.

Drying by heat makes the tone bluer than it would be if it were allowed to dry without. Then, again, if the porcelain is to be dried by heat, place it in the negative oven, permitting it to dry gently. Before placing it in, however, wipe out the oven with a damp cloth; and in drying spontaneously, hang up the plate upon two nails away from draughts, which may cause dust to settle upon it.

Tinting.—In tinting the cheeks and lips, you can either do it with a flesh wash, or by dry colour. The latter is sometimes applied to the cheeks and lips of the porcelain print after the plate is varnished, because in varnishing the plate, after the dry colour is applied to it, it sometimes comes off during the flowing of the varnish back into the bottle.

If the plate is not warmed before you flow the varnish on it, and is dried up quickly, the colour will not disappear; but if it is warmed before varnishing, it will surely disappear.

Proof: Experience in varnishing by both methods.

The object in first warming the plate before varnishing is to prevent it from getting chilled in drying, but unless it is very cold indeed, the varnishing and drying quickly in a hot oven will place a splendid gloss on the plate. In spotting, mix the colour to the proper tone, being sure that you also have gum-arabic in it in abundance.

A most excellent hit is to colour the hair of the porcelain print, if the print is that of a blonde—either before or after varnishing, as may suit the printer—with a little dry yellow colour, and the effect will be splendid.

SPOTS ON VARNISHED LANTERN SLIDES.

BY JOHN M. BLAKE.*

I RECENTLY had occasion to look into the cause of certain spots that had made their appearance on a lot of lantern slides, and found two varieties.

In one case the difficulty all came of allowing the glass cover to touch the varnished film. The two glasses were of plate, and the contraction of the binding-paper on drying may be supposed to have drawn them in close contact. The trouble only made its appearance after a considerable time, and some slides of the same make were affected worse than others. Then peculiar spots, resembling bubbles, made their appearance in the varnish, and when one of these came in a shadow, it showed as a round puncture, having a diameter not exceeding one thirty-second of an inch. There might be a hundred or more of these spots pretty evenly distributed over a slide; besides which there would occasionally be a portion of the surface containing them closely packed and in large number. In the case of a slide in which the adhesion of the two glasses was but slight, it was found, on cutting the binding-paper, that the cover was smeared with varnish, which required alcohol for its removal; and it was noticed that specks of dust and small filaments were closely adherent to this surface, and these were exactly opposite to the spots on the film. It is probable that the moisture in the atmosphere, which constantly varies, had acted unequally on the binding-paper, according to the accidental position of the slide to adjacent objects, or to currents of air, and this had produced contractions and expansions which had caused these adherent particles to excavate the peculiar round pits in the varnish opposite to them, in the same manner that the finger would make a cavity in a surface of clay, if moved a short distance in every direction.

It would seem that change of temperature, so far as affecting the glass itself, would not be sufficient to account for the amount of motion that had evidently taken place, particularly as both glasses would be likely to expand at the same time.

In the second instance the precaution had been taken to separate the cover from the film by an outline square of paper; but there came another trouble—there was a volatile constituent in the varnish; the smell suggested that a portion of benzoin had been used, and a sublimate of minute, well-defined crystals made its appearance on the cover. These crystals were not from cyanide or hypo left in the film, as proved by their presence on the covering-glass only, and from the fact that they were insoluble in cold water, but dissolved immediately in alcohol. The precaution should therefore be taken to select varnish that is free from volatile substances of this character.

In the last case the slides were not ruined; it was only necessary to remove and clean the covers, to restore them to their original state; but the peculiar behaviour of the resins contained in varnish, as first mentioned, when it is closely pressed between two hard rubbing surfaces, as a lantern slide and its cover have proved themselves to be, will ultimately cause the destruction of a slide, when this condition of things is allowed to occur.

It is possible that some varnish may stand this treatment, and again some slides may escape from the curving of the glass not allowing contact of the surfaces.

SOLVENT POWER OF GLYCERINE.—The solvent power of glycerine upon several substances commonly used in medicine and the arts is as follows: 1 part of sulphur requires 2,000 parts of glycerine; iodine, 100 parts; red iodide of mercury, 340 parts; corrosive sublimate, 14 parts; sulphate of quinine, 48 parts; tannin, 6 parts; veratrin, 96 parts; atropia, 50 parts hydrochlorate of morphia, 19 parts; tartar emetic, 50 parts iodide of sulphur, 60 parts; iodide of potassium, 8 parts sulphide of potassium, 10 parts.

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PHOTOGRAPHY AT THE INTERNATIONAL EXHIBITION OF 1876 IN AMERICA.

THE International Exhibition to be held in Philadelphia next year will be conducted, if we may judge from preliminary announcements and arrangements, on a very grand scale, and American photographers—or, at least, the representative men amongst them—are anxious that photography shall occupy a position worthy of the art and worthy of the occasion. Besides the main building to be devoted to the purposes of the exhibition, a Memorial Hall will be erected, to be devoted entirely to a display of fine art, and it was the original intention of the Commission to give photography a position in this hall amongst the fine arts. But it appears that the extended claims of the elder representatives of the art sisterhood—painting and sculpture—absorb the space, and photography can find no resting place there. To prevent the risk of the photographic contributions of the world being scattered over different departments of the main building, possibly spoiled by bad light, and losing all special interest by burial amongst a mass of distracting things, the National Photographic Association of the States have published an appeal to photographers to aid them in securing for photography a distinct hall in which the contributions of photographers throughout the world can be displayed together. The authorities of the International Exhibition entertain the proposition favourably, and have agreed that if photographers will subscribe for shares to the extent of \$20,000 in the general stock, which has been created for the management of the general enterprise, a handsome building for that amount shall be erected, and devoted solely to photography. We are uncertain at present whether the amount will be raised, but, from our observation of the pluck and enterprise of American photographers, we have no doubt that before these lines are published the project has become *un fait accompli*. The shares are, it seems, \$10, or, in English money, about £2 each, and the project, it is anticipated, will be a financial success, so the scheme is promising as an investment. Apart from the prospect of commercial returns, the idea appears to be enthusiastically taken up by some of the best men in the States. The president-elect of the next Convention of the National Photographic Association, Mr. Rulofson, has offered to contribute thousand dollars, or more, if any photographic firm contribute more. A project taken up in such a cannot very well fail.

Our principal object in briefly detailing these inter

facts is to secure a preliminary interest in the forthcoming exhibition. It would be a mortifying disappointment to our American brethren, and a deep discredit to the photographers of the world, who make such an effort to secure a suitable hall for the satisfactory display of photography as it exists everywhere, if the contributions were inadequate to the occasion. The photographers of America are not simply looking to the exhibition of their own work; they are anxious, as the published manifesto appealing to the photographic community states, to offer to their co-workers abroad an opportunity of exhibiting with them, and producing such a display of photographs as no other occasion has brought together. The building will be a noble one, admirably lighted, and admirably arranged for photographs and "all articles pertaining to their production." We should like all our readers in this country, and in Continental Europe, to resolve to send some worthy contribution to aid in securing an exhibition of photographs befitting the occasion. Of course many of our readers may not see the display, but surely they will have enough *esprit de corps* amongst photographers to feel interest in the success of a great enterprise in which the prestige of their art is concerned. Details of the conditions and arrangements of exhibiting have not yet been published; but we shall bring before our readers in due time all the information for their guidance which may be issued.

THE PHOTOGRAPHIC EXHIBITION.

PORTRAITURE.

THE proportion of portraiture in the present Exhibition, if we except the examples of enlargement, is less than usual, but includes some very good work. A frame which is hung somewhat below the line, and which may, therefore, escape the attention of some, will be carefully examined and well remembered when once seen: we refer to "No. 117, Imperial Portraits," exhibited by Mr. E. Greaves, of Halifax, who is, so far as we remember, an exhibitor for the first time. The size termed Imperial is the usual whole plate, the finished print being about eight by six inches. The portraits in question are busts and three-quarter lengths, all vignettted into grey grounds with unusual skill. The lighting is concentrated, giving fine vigorous modelling, without any sacrifice of softness and delicacy; the *chiaroscuro*, whilst forcible and effective, is not excentric, nor does it trench upon the bizarre effects often exhibited as Rembrandtesque. There is remarkable ease and naturalness in the pose and expressions, giving a sober grace and dignity of style. The light and shade in the grey vignettted backgrounds is admirably managed, giving great value to the figures. The tone of the prints is singularly rich, warm, and sunny. Altogether, the frame of portraits is one which all photographers may find it instructive to study.

Mr. T. Protheroe shows two frames of cabinet portraits (5 and 33) possessing much technical excellence, seriously marred in some cases by the injudicious use of accessories. The white globe of a table lamp, for instance, forms by far the most prominent object in one or two instances, and is seen afar off before the portrait itself has caught the eye. The lighting on the face is intense, and, apparently, supposed to come from the lamp; but there is no canon of art more imperative than that which insists on the most important part of a picture being treated so as to secure attention first: the head should be at once the focus of light, of definition, and of interest: other details—accessories, especially—

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ground accessories, without detracting from the full interest of the figure. The portrait is that of a beautiful woman, whose fine face and exquisitely modelled arms are rendered admirably, the flesh texture being singularly fine. The rendering of textures is, indeed, a special feature of the picture: besides the skill with which flesh, hair, and drapery are rendered in the figure, the texture of the massive folds of drapery forming the background, which is kept subdued and low in tone, is very perfectly rendered. Altogether the picture is very fine. Mr. Young, who exhibits some of the finest portraiture in the room, has several other examples, No. 130, perhaps, pleasing us least, the face being low in tone, and too nearly alike in texture to the subtly and finely rendered light drapery.

No. 28 is a fine large costume portrait by B. Wyles and Co., and is apparently taken direct in the camera. It is well posed, well modelled, and of unusually rich tone. Messrs. Chaffin and Sons send a number of large direct portraits, about twenty-two inches by eighteen in size. These are chiefly full length standing figures, and possess for the most part somewhat more pictorial character than is aimed at in ordinary portraiture, a lady equipped for archery (124), entitled "Belle and Bow," pleasing us best. A full length figure on a nearly square canvas presents considerable difficulty as regards background, and in these cases the ordinary proportion of a whole sheet of paper unnecessarily taxes the portraitist: a better proportion would have given less trouble, and have been more effective. Some portraits of the same size by Cooper and Moorby, of Hull, are very excellent; they are chiefly seated figures of three-quarter length, and better fitted for the proportion in question than the full length standing figures. We may congratulate Mr. Cooper on an advance in his work; his contributions of this year possess a quiet harmony which is better than the pronounced light and shadow of some of his earlier contributions. Mr. Crawshaw's direct life-size heads are very fine; full of power, yet exceedingly delicate. "Bluebell" (189) is in our estimation the finest, although it is run very close by "Daisy" (200), two charming faces admirably treated.

Some very striking and effective large portraits are exhibited by Mr. Hugo Theile, of Dresden. These pictures are singularly brilliant in their contrasts, without being hard, the background and accessories being, perhaps, too prevalently dark. The definition is amazingly perfect throughout, every detail in somewhat ornate accessories, on a plate about eighteen inches by twelve, as well as in the full-length figures, being perfectly made out, and justifying the mention made on the mount, to the effect that the result is due to Dallmeyer's 6A patent lens. A series of large portraits, sixteen by twelve, is exhibited by Mr. G. Nesbitt, who is, so far as we remember, new as a contributor to the Exhibition. Much of his work is very excellent, admirably lighted, and harmonious without lack of force; (127) a portrait of a lady, is especially fine. Some smaller figure studies are also very effective. Mr. John Hawke exhibits some frames of imperial portraits possessing much photographic excellence. A large collection of portraits of various sizes is contributed by Mr. J. A. Todd, of San Francisco, of which the essentially technical qualities are very excellent; but there is lack of artistic feeling. Miss H. Paget sends some small portraits which possess a singular amount of freshness of treatment and pictorial value.

We have already noticed the charming artistic portraits in carbon exhibited by Mr. Faulkner. In addition to these, two frames, containing many small photographs of children, are exhibited by the same artist. Every variety of infant charm is represented in every possible attractive form. There appears to be some subtle affinity between Mr. Faulkner and the little ones, by which they are not only attracted to his studio, but also submit to his photographic management. The photographic and artistic treatment are perfect. Mr. H. Garrett Cocking exhibits

some good examples of character portraiture, possessing technical excellence, and skilful embodiment of an idea. Some portrait studies by Mr. Stodart possess good qualities. Messrs. Ganoff and Goddard send some good studies. Studies of children by Mr. T. C. Turner are good, as are also some examples of portraiture by Barry and Co., and others.

Amongst special forms of portraiture, Mr. Piercy exhibits two very fine examples of his crayon finished reproductions from small paper prints. Messrs. Spencer, Sawyer, and Bird have a frame of very fine carbon prints on ivory; and some on porcelain, which are hung too high for careful examination, but they scarcely seem equal to the ivory specimens. A frame of ferrotypes sent by Captain Turton are excellent in a technical sense, and possess that art feeling by which Captain Turton's work is generally characterized. Some examples of portraiture by the Woodbury process are unusually fine. A frame of autotype cabinet portraits, sent by Messrs. Spencer, Sawyer, and Bird, are amongst the most satisfactory examples of portraiture in the room. A portrait possessing a curious interest is the Maharajah of Punnah, taken by his Prime Minister, the photograph having been sent to Mr. Hare, by whom the apparatus had been supplied.

Amongst the specialties in portraiture, more interesting than attractive, are two frames containing large collections of portraits exhibited by S. G. Payne, who is, we understand, photographer to Aylesbury Gaol. They are exhibited as physiognomical studies, and they present truly a curious problem for the student of human nature, who hopes to "read the mind's construction in the face." In a photographic sense the work is good throughout, better than, under the various difficulties in such cases generally prevailing, might have been anticipated. In some cases the expression is fretful, in some defiant, in some purposely distorted as if to mar identity; but in the greater majority it is simply vacuous and stolid, indifferent or hopeless. The fixed lines of the faces do not in the majority of cases suggest vice, malignity, or cunning; in very few cases is the "forehead villainous low," the eye malignant, or the jaw and mouth coarse and heavy. They are simply commonplace, somewhat sad-looking faces; the forehead and cranium generally do not indicate special lack of brain power; but the expression does suggest lack of culture and absence of happiness. Of course there is nothing bright or winsome in any face in this rogues' gallery, and few traces of the capacity of humour. They excite feelings of pity and sadness rather than repulsion, and a wistful wonder as to how the "paragon of animals" could have fallen to such a low estate!

PHOTOGRAPHY IN SIAM AND JAPAN.

It will be remembered by some of our readers that Mr. F. Beasley, a skilful landscape photographer, whose excellent work on Fothergill plates has often appeared at photographic exhibitions, went out with the scientific party who, in acceptance of the invitation of the King of Siam, journeyed to the East to observe the last solar eclipse. A long and interesting letter to Mr. Frank Howard gives graphic notes of travel, occasionally entering into photographic details which may interest our readers. After an account of the voyage, and the various points of call, and a brief description of Bangkok, the port in the gulf of Siam, a town in which all the houses are built upon floating rafts of bamboo, we have some details of the observing station at Chulai, about forty miles along the coast. Some idea of the efficiency of the help in arrangement afforded by the feeble and lazy natives may be formed from the fact that it took forty of them to carry one case of apparatus weighing eleven hundredweight. Regarding the photographic arrangements, we give a brief extract in Mr. Beasley's own words.

"We found that preparations were well made, the place

being previously nothing but a jungle; there were now three houses, one for the Prince Regent, one for Professor Janssen the French astronomer, and one for ourselves. Observatories, dark rooms, &c.,—nearly everything was formed of bamboo and palm. The expedition is indebted to Captain Loftus, who carried out these arrangements so admirably. Our provisions were equally well-managed, and included £20 worth of ice, which we found very acceptable; the weather being very hot, and our time being so very short (only about five days), we were obliged to work during the heat of the day. Our photo outfit was of the usual kind, including two tents made by Collins, St. John's Wood, something like Smart's tent, but much stronger; Blanchard's collodion; the chemicals supplied by Thomas, and I think only a small funnel was broken. The collodion was packed in tin cases, which we put in the ground to keep cool. We had the assistance of several officers and men of H.M.S. "Lapwing," who rendered great service in counting time, &c. The Hon. — Shawe took a capital sketch of the corona. Mr. Eeske rendered good assistance in the photographic work. As to the amount of success we obtained, you have no doubt seen in the papers, as both Dr. Schuster and Mr. Lott have, I believe, each published an account, and, although we did not succeed with the siderostat, on account of the shortness of time to get so delicate an instrument in working order, I believe the success with the prismatic camera is considered well worth the time and expense; and I believe with a shorter focus lens, or more powerful one than was attached to the siderostat, that the spectrum of the corona is to be photographed, as the light, I believe, is very white and actinic. The next day was employed in copying, &c.; I also took a few views before leaving, but they were taken in a great hurry. We were also assisted by the local photographer of Bangkok, who was sent to us by the king. We left Chulai Point April 11th, and after spending two days at a pretty place called Petchaburré, at the invitation of the Governor, we returned to Bangkok on the 14th. On the 16th we had an interview with the king in the blue drawing-room, a room most elegantly furnished in quite European fashion. We also went into his private temple, which is very gorgeously decorated. On the 21st we went to a garden party given by the king. A very large umbrella was held over the king's head all the time he was in the garden. In the evening there were fireworks. Cremation is generally practised by the Siamese. On the 28th we went to the burning of a princess and two princes. The coffins were gilt and suspended over a pile of scented wood, and were lighted by the king. Limes containing money were afterwards thrown to the people, and followed by music and fireworks. Most of the Siamese use the betel nut, from the highest to the lowest. Their teeth are jet black. The natives wear very little clothing, but are a very peaceable race. We left on the 9th of May, and arrived at Singapore on the 14th. Dr. Schuster intended going to India, and waited for the steamer; Mr. Lott returned to England, Mr. Eeske to Germany, and I thought that being in the East I should like to see a little of China and Japan."

After varied experiences in China, in which photography took no part, Mr. Beasley proceeded to Japan, and there met with various matters of photographic interest, from which we make brief extract. He says, having travelled for a few weeks in Japan, and returned to Yokohama,

"I hope now to devote a little more time to my camera. I only brought with me three dozen Liverpool seven-and-a-half by eight plates, and some of Kennett's. I have found here a very enthusiastic dry plate photographer (professional), and this evening we intend preparing some trial plates, both tannin and Fothergill. I obtained a few stereos of the temple at Bangkok, which I developed in the dark room of the local photographer; he was Siamese, and a very good worker, and was using the English collodions and a Roush's tent (rather an old one), and English

lenses. He frequently added dilute gold solution to his pyro and silver developer when intensifying. I have taken a few views here of the Sheba Temple. The photographer here, M. James, a Frenchman, works the tannin process, with gallic and pyro developer, and uses a dish. He likes the following substratum for his plates,—

Gelatine	...	...	2 grammes
Distilled water	...	...	500 "
Alcohol (absolute)	...	...	500 "

The gélatine is first dissolved in twenty-five grammes of water, and four grammes of pure glacial acid are added, which will turn the solution white; after twenty-four hours the remainder of the water is added, filtered, and then the alcohol is put with it (they will keep for years), and he pours it on the glass like collodion. We have been comparing Fothergill with tannin, but our old friend Fothergill proved the best. We prepared a few last night, washing away silver, and giving a final coating of gallic. I do not know how they will succeed, the weather being now very hot. I have also tried some gelatine plates, but at present have not hit the right exposure. I exposed one for two seconds, view lens, four-and-a-half inches focus, and smallest by one stop, and it was much over-exposed. It is necessary to ice everything when developing. I often think of the Field Club. I hope it is flourishing."

ON PRESERVING SENSITIZED SILVER PAPER.

A LITTLE while ago M. Carrier, whose durable sensitive paper is well known in this country, although of late, we believe, it has ceased to be a commercial article in England, brought before the French Photographic Society a product to be employed for preserving albumenized paper of any description after it has been sensitized. M. Carrier's remarks upon this new product were as follows:—

"This preparation will keep good for an indefinite period, and for purposes of commerce it will be made up in the shape of tablets. It contains no sulphurous compound, nor that element in any form, but its preparation is based upon the properties of certain chemical agents, which play the rôle of reducing agents to chloride of silver *under the influence of light only*, while they are quite inert upon the paper in the dark. In February, 1868, I presented to the Society, it will be remembered, some prepared papers, and in May following a commission reported that they had kept perfectly good without having been the subject of any special precautions. If these specimens still exist in the archives of the Society, it would be easy to examine their state now, and report the result. Some of my paper has made a voyage to India, and has come back after the lapse of two years perfectly well preserved, without any particular precautions having been taken to keep it good. I did not indicate the mode of preparing the paper in 1868, but it is as follows:—

"The preservative compound is dissolved in water (each tablet is enough for one litre), and, after having added two per cent. of chloride of sodium, the sensitive albumenized paper is immersed dry in the solution. Five or six minutes is sufficient for its immersion; it is then dried, and may be kept for years. The paper may also be treated by washing it on its exit from the silver bath; but in that case, instead of immersing the paper, it is preferable to impregnate it on both sides with the solution, by means of a large soft brush, in such a way that all the sheets piled upon one another receive the solution *fresh*.

"This method has two advantages: there is only one drying operation; and if the sensitizing has been properly conducted, all the sheets will be of the same vigour in printing, provided that all of them have been treated with *fresh* solution, the latter being capable of use to the last drop.

"By this method all the nitrate of silver is converted into chloride, and this is replaced on printing by the preservative,

which acts upon the chloride of silver as a reducing agent. The printing should be vigorous, and after careful washing, to remove from the prints all unnecessary products, the toning operation is carried on with a liquid made up of

Water	...	...	...	1000 grammes
Chloride of zinc	...	...	...	10 "
Sulphocyanide of ammonium	...	...	...	80 to 100 gr.
Chloride of gold	...	...	...	1 "

Chloride of zinc, or cadmium, is necessary for regulating and clearing the bath; the fixing and washing afterwards are conducted in the ordinary way.

"Some years ago I made some very successful experiments with a view of replacing albumen by gelatine in these papers. This is how I proceeded: I first dissolved the preservative, and then gelatine, in sufficient quantity to form a beautiful brilliant surface after desiccation; I then added, at a temperature of 50° Cent., some chloride of silver obtained by precipitation, and washed, in quantity sufficient to give, with the gelatine, a white cream. I spread this upon an endless band of paper, or upon cardboard, and allowed it to dry, the surface thus prepared being as permanent as that of albumen. The prints produced are treated in the same way as ordinary ones, only that I pass them through a solution of nut-galls after fixing, and finish by washing in the ordinary manner. The prints are very fine, by reason of their depth and the beauty of the tone. The printing goes on rapidly, even in the shade.

"This last method is a truly practical one, by reason of its simplicity and regularity of its products. Albumen is dispensed with, together with the sulphur which it may contain, and the sensitive film not being in the paper itself, any description of material will serve, even some kind of Bristol board. I have obtained some very good results without employing papers specially prepared for photographic printing."

M. Carrier accompanied his communication to the French Photographic Society with a specimen of his preservative material, but we are not aware whether the same is as yet to be obtained in commerce, or under what name it is to be brought under the attention of photographers.

A NEW APPLICATION OF COLLODION.

ALTHOUGH collodion has done much for the scientific world in depicting the most minute stars and the constant changes upon the sun's disk, as also in recording other phenomena connected with light, there has been, says Dr. Schnauss, in the *Photographisches Archiv*, no record of any physical application of the material in the laboratory.

Dr. Schnauss informs us that for some years past he has, however, employed collodion films for physical experiments, and has constructed a vessel or bag of collodion, for use in dialytical and endosmotic investigations; while recently we heard that M. E. Grippon recommended collodion films stripped from glass plates for experiments with polarised light and heat rays.

Collodion films polarised both reflected as well as transmitted light, and—so we are told—a film which accurately measured under a microscope was found to be 0.0081 to 0.0088 millimetre, in thickness gave the angle of greatest polarisation, viz., 33°55', its index of refrangibility being = 1.5108.

The film allows heat rays from an illuminated heat source to pass to the extent 0.91, while with a blackened vessel of boiling water only 0.70 passes. If the temperature of the heated water only amounts to 50° (Reaumur) only 50 goes through. Two films laid upon one another do not allow so much heat to pass, and from a source having 100° Reaumur of heat only 0.583 passed through.

For polarisation experiments, collodion films are to be preferred to mica plates, from the circumstance that they are more transparent; and if they are somewhat more fragile, this disadvantage is compensated for by the cir-

cumstance that the films are easily prepared. For heat experiments, as we have seen, collodion is particularly suitable.

THE CONVEX PICTURE.

A correspondent of the *Western Photographic News* describes a novelty under the above name. To produce them he gives the following directions:—

"Make the print very dark—so dark that the lines all run together; then tone the very life out of it. Cut the print a little smaller than the convex glass used. Have glass perfectly clean. Wet the print, and blot off the surplus water; paste the face of the print with thin starch paste, and cover the concave or inner surface of glass with the same paste, using great care to work the paste smooth on both print and glass. Lay the print on the concave side of glass, the starch or face side down, and proceed to work out air-bubbles with the finger. Then take two thicknesses of fine ribbed filter paper (or any soft, tough paper will answer), and put next to print; then, with a common ivory paper-cutter or flat stick with curve about the same as the glass, work out the air—working from centre of glass to the edges. This work has to be done very quickly, as the print dries fast. When thoroughly dry, take a good quality of castor oil and saturate the print. Let stand twenty-four hours, or long enough to clear up, after which drain off the surplus oil and wipe with soft paper. Back up the picture with pink cardboard—light or dark, as suits your taste. I find the greatest trouble occurs in getting my paste the right thickness, so that the air-bubbles can be worked out easily

HOW TO CALCULATE THE DISTANCE FROM THE LENS, AND FROM THE FOCUSING GLASS TO THE MODEL, IN ORDER TO OBTAIN AN IMAGE OF A PARTICULAR SIZE.

BY A. DE BLOCHOUSE.*

It frequently happens that the photographer has to produce an image of a particular size, either in an approximate way, when it is a question of taking an object or monument from nature, or when the result is to be a particular fraction of the model, supposing the latter to be a map, plan, or picture.

In the first case you may make use of the formula well known in optics—

$$D = \frac{(M+I) F}{I}$$

in which D represents the distance of the lens from the model, M and I the respective sizes of the model and the image, and F the focus of the lens.

In the second case, if the image is to be a particular fraction of the model—for instance, $\frac{1}{a}$ —the value M may be replaced by a I, and the reduction of the formula will then give:—

$$D = (a+1)F;$$

that is to say, the number of times the focus equal to the denominator a of the fraction, plus one unit; or, in other words: to reduce to half, it is necessary to place the model at a distance from the lens equal to three times the focus; to reduce to a third, at a distance of four times the focus; to reduce to a fourth, to five times the focus, &c.

I shall do well, perhaps, to give here other formulæ indicating the relations which exist between the focus of the lens, its distance from the model, the size of this and of the image. The use of these formulæ in practice cannot be too much insisted upon. I will state the formulæ side by side with the questions to which they correspond.

$$I = \frac{M F}{D - F}$$

What will be the size of the image you will obtain from a model whose dimensions are known, the distance being known and the lens also?

$F = \frac{I D}{M + I}$ What lens should be employed to obtain an image of a particular size when the dimensions of the model are known, and the distance is a limited one?

$M = \frac{I(D - F)}{F}$ What is the size of a model which, at a known distance, gives an image of known size with a known lens?

It is interesting to know, moreover, whether the camera employed is long enough to adapt itself to a certain lens. To give this we use another formula, also well known in optics:—

$$d = F \left(1 + \frac{I}{M} \right)$$

or the distance d of the lens to the ground glass. By replacing M by $a I$, it becomes—

$$d = \left(F \left(1 + \frac{1}{a} \right) \right)$$

signifying that the drawing-out of the camera is equal to the focus, plus a fraction of the equivalent focus, in the ratio of the image to the model; or, in other words: to obtain an image equal to the half of the model, the drawing out of the camera should be equal to one and a-half times the focus, and for an image of one-third, one and one-third of the focus.

I do not know if the results deduced from these formulæ have been previously published; but I think, at any rate, it is useful that they should be brought forward. To make use of them it is necessary, of course, in the first place, to commence by determining the foci of the lenses at one's disposal, which is a much more important matter than to indicate the size of the lenses, which can serve very little purpose. Many photographic treatises show how this can be done, but I will save trouble by mentioning the method here.

Upon a screen of a darkish tint is pasted a band of paper of some clear colour covered with fine lines. These lines are focussed in the same way as if a reproduction of them is to be attempted, and the model is moved to and fro towards the camera until the image upon the ground glass is exactly the same size as the model. Of course, it is necessary that the plane of the screen should be parallel to that of the ground glass. In this position the lens is screwed off the apparatus, and you measure the exact distance from the ground glass to the screen. The quarter of this distance gives you the focal length of the lens. If the lens is then replaced in the camera, and, following its axis, you measure from the screen an interval of twice that of the focal length, you determine at once the starting point whence you must calculate the sizes of D and of d when making use of the formulæ I have given. The same formulæ also give these results by calculation; for as $I=M$, the values of D and d become respectively:—

$$D = 2 F \quad (\text{focal length})$$

$$d = 2 F$$

and, therefore,

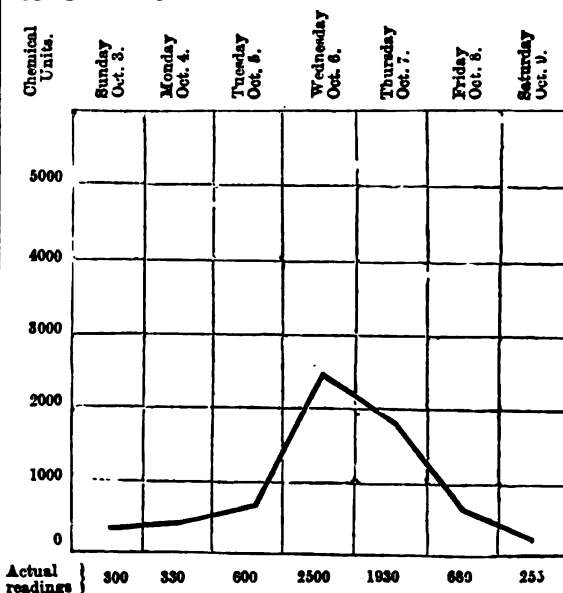
$$D + d = 4 F$$

METEOROLOGICAL REPORT OF THE DIURNAL VARIATIONS IN THE CHEMICAL POWER OF THE DAYLIGHT OF THE SOUTHERN SKY, FROM OBSERVATIONS MADE AT BLACKPOOL, LANCASHIRE.

BY D. WINSTANLEY, F.R.A.S.

THE past week has been less light than any of the five immediately preceding it; in fact, it has been a dark week, the daily average being only 942 chemical units, or nearly 600 less than the daily average of the week before. The aggregate amount of chemical force during the week has not exceeded by ten per cent. that of a single day in September, viz, the 11th. In other words, as much printing could be executed by the photographer on that day, as during the whole of the week which has just passed—a circumstance which some amongst your readers will doubtless be able to verify from an inspection of their books.

Those whose businesses lie in towns, and who depend upon a resident rather than a migratory population for their trade, will probably find the number of negatives they take to rise and fall with the rising and falling in the aggregate of light.



A SILVER BATH FROM DITCH-WATER.

BY F. J. K.*

ALL our formulæ tell us to use pure water in making up our silver solutions. I was led into a discussion, a short time since, with a brother photographer on this one point of our manipulation, and it finally led to a small wager that I could not make a bath with such water as he might furnish, the first plate exposed in the bath to give a good negative.

The water came; it was evidently such as he had dipped up from some bog-puddle—muddy, greasy, and in every way filthy; and from this stuff I was to make a half gallon of silver bath which would work from the start. I commenced my labours, and had one week to finish the undertaking. First, I let the mud settle in the bucket in which I received the water, skimming off the green mass and the grease which floated on the surface. After leaving it a few hours to settle, I carefully decanted the liquid into a tall glass candy jar, and found I had about one gallon of stagnant water, anything but inviting for the purposes intended. I let it stand over night, and, for a result, had about half an inch of settleings in the bottom of the jar. I again decanted into another clean jar the liquid from the mud, and I had a little less than three quarts of water. I now added half an ounce of nitrate of silver, which turned the liquid brown before it was half dissolved. I placed the jar in the sun for one day, and in an hour it was black as ink; by next morning it showed signs of clearing up, and I again decanted the clear solution. I filtered it carefully, and made my bath by adding nitrate of silver sufficient to bring it up to forty grains strength, adding one and a-half grains of iodide potassium for each ounce of silver used, shaking thoroughly. I put the bath in the sun, and left it for two days, when the solution was perfectly clear. I filtered through prepared cotton, and, finally, added c. p. nitric acid until blue litmus paper turned slightly red. Placing the solution in my bath tub, I coated a plate with collodion, and left it in the bath over night. The result was that the first plate dipped in the bath and exposed in the camera gave a fine negative.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE first ordinary meeting after the summer recess was held in 5, St. Andrew Square, on the evening of Wednesday, the 6th inst., the President, Dr. THOMPSON, in the chair.

The minutes of the previous ordinary and five out-door meetings were read and approved, and a large number of pictures, the work of some of the members during the season, were laid on the table for examination.

Some observations on the processes and methods of manipulations by which the pictures were produced were made by several of the exhibitors, but on the suggestion of Dr. Nicol it was resolved that a portion of the time of each of the forthcoming ordinary meetings should be occupied by an exhibition and detailed account of the work of one member; and as it was understood that failures, as well as successful pictures, should be shown, it is hoped that much general information may in that way be elicited.

THE PRESIDENT then gave an interesting account of the several out-door meetings that he had attended, and said that he was very well pleased with the beer and albumen process, which he had almost exclusively wrought, and that he considered the addition of gallic or pyrogallic acid, or some similar body, absolutely necessary for the successful working of that or any other dry process. He further added, that as to the question of how long the preservative might safely be kept, he might say he made up as much as would last during the season, and that the addition of a small quantity of an alcoholic solution of salicylic acid entirely prevented decomposition. He was, he said, decidedly in favour of rather long exposures, and he generally removed the trace of fog, which was produced during development, by a wash of a weak solution of iodine in potassium iodide, followed by the application of a weak solution of potassium cyanide, when the required density and brilliance would be found to be easily produced by pyrogallic acid and silver.

Mr. W. H. DAVIES then read a paper on "Photo-Lithographic Etching" (see page 493), and showed some specimens of work done in that way.

THE CHAIRMAN was much interested in Mr. Davies' paper, but thought that he was somewhat mistaken in supposing that the Messrs. Malloch claimed anything more than the mere varnish or coating which they applied to the glass, and which was of such a nature that a pencil drawing could be readily transferred in the ordinary way, and then traced or etched with any fine point, giving lines of perfect sharpness. So far as the method of etching was concerned, it was useless for any one to lay claim to it—in recent years, at least—as it was well known that it had been done by Fox Talbot more than a quarter of a century ago, and both Bingham and Hunt described an exactly similar method as proposed by Mr. Havell.

Mr. NORMAN MACBETH wished to corroborate all that Mr. Davies had said about his connection with the matter. His attention had been attracted to it in consequence of his son scratching, with a graving tool, the films of some negatives he was washing off the glass, and exposing some sensitized paper under them. The result suggested to him an easy way of multiplying sketches, the only drawback being the difficulty of properly judging as to the progress of the work on the darkened collodion film, and the apparent rottenness of the lines. Acting on the suggestion of Mr. Davies, he obviated the former by using a simple iodized plate, which was subsequently blackened as explained by Mr. Davies, and the latter by a substratum of albumen. On plates so prepared, his son had done a great many things, and, so far as he could see, there was nothing in Malloch's preparation that was in any sense an improvement on what had been described before the Society in 1868.

Specimens of etchings on Malloch's plates, and lithographic copies made from them, were handed round for inspection, and were very much admired.

Mr. TURNBULL said that he had seen some of Mr. Malloch's plates more than a year ago, and thought they were admirably adapted for the purpose intended. The varnish seemed to be a mixture of wax and a yellow pigment, combined with a drying oil of such a nature that it got dry without becoming hard.

Mr. DOBIE thought that there was possibly some misapprehension between Mr. Davies and Mr. Malloch. So far as he could understand, Mr. Macbeth had confined himself to printing on sensitized paper from the etchings that he made, while Mr. Malloch reproduced them by photo-lithography. Now, if that was original with him, he deserved all the credit of the idea.

Mr. NEMSON thought it was quite possible that Mr. Malloch never thought of making any claim in the matter, but that the article was wholly the work of the reporter, who, probably not knowing much of photography himself, and admiring the undoubtedly fine results that had been produced, had thought the whole thing was new, and written accordingly.

Dr. JOHN NICOL said the matter lay in a nutshell. Whether Mr. Malloch did or did not make a claim of the whole process was not exactly the question; but was the claim made for him in the paragraph from the *Scotsman*, which Mr. Davies had read? He thought it was, and that Mr. Malloch by his silence had accepted it. If so, then it was clearly their duty, as a society, to put the matter right, and give credit only where it was fairly due. The public generally knew very little technically about photography, but looked to the societies and to the journals for their information, regarding it pretty much as too many look to their favourite newspaper for their politics; and, therefore, the societies should be always careful to send out no uncertain sound on any question that fairly comes before them.

Mr. MATHESON then proceeded to show on the screen a series of very fine transparencies of animals, which he had made from negatives kindly lent by Mr. Foster, of Coldstream. They consisted of horses and men apparently engaged on the ordinary work of the farm, such as ploughing, carting, cow-milking, &c., and were very much finer than anything of the kind ever shown before the Society. He also showed some fine transparencies from his own negatives of Edinburgh, Melrose, Dryburgh, &c. The lantern was illuminated by Turnbull's triple-wick lamp, which has recently been much improved, and which, under his own management, gave such a brilliant disc that on several occasions the effect of the picture was enhanced by slightly lowering its intensity.

At the close of the exhibition, votes of thanks were given to Mr. Forster, Mr. Matheson, and Mr. Davies, and the meeting was adjourned till Wednesday, November 3rd, when the annual meeting for the election of office-bearers, &c., will be held.

Talk in the Studio.

AUTOTYPE WORKS.—We have just been favoured with one of the most perfect examples of photo-collographic printing we have seen for a long time, in the shape of a fine view of the extensive works of Messrs. Spencer, Sawyer, and Bird, at Ealing. The picture is about 16 inches by 8 inches, and gives a most accurate as well as imposing view of the extensive premises. Nothing could exceed the delicate gradation of half-tone, whilst there is all the depth and richness of a fine silver photograph, from which, indeed, it is difficult at first glance to distinguish this photograph. We recommend a person interested in this branch of our art to obtain a copy of the print before us as a choice example of photo-press printing.

MAGIC LANTERNS: HOW MADE AND USED.—A capital little lantern manual, by A. A. Wood, F.C.S., has just been issued by Mr. Wood, of Cheapside. It is full of information, simply and clearly conveyed, on the construction of various lanterns, the different kinds of lights, and the varied forms of slides, with the modes of preparing and using them. We commend it to all interested in the lantern.

STUDIES FROM NATURE.—Messrs. Sampson Low, Marston, and Co. are issuing a series of photographs by Mr. Stephen Thompson under this title. Each monthly part, which is printed in folio, contains four fine photographs of landscape, sea-piece, groups of cattle, or other gleanings from nature, with descriptive text. The subjects in the two numbers issued, are well selected, and photographed with much artistic feeling, as well as technical skill. The prints are described as printed by R. and G. Taylor's photo-mechanical process, which appears to be similar to the photo-relief process, and the prints are fine examples of this method.

PORTRAIT OF THE QUEEN.—A very noticeable element in the influence of photography on art is found in the various published portraits in the present day. A very noble portrait of the Queen has just been issued by Messrs. Cassell, Petter, and Galpin, with Part I. of their new Illustrated History of England, which, although produced by lithography, has all the literal truthfulness of effect of photography, with a dignity which all photographic portraits have failed to give Her Majesty.

PHOTO-RAISED SURFACE BLOCKS.—The *Stationer*, referring to this subject, describes the success of Mr. J. H. Banks, of

Battersea, who, it is stated, about two years ago completed and patented his system, which had cost him upwards of twenty years' hard study and experiment. The *Pictorial World* and *Illustrated Sporting and Dramatic News* patronize this process, the chief claim to superiority over other systems being that all blocks are supplied in the electrolyte. It is contended by the Banks advocacy that no zinc process will in the end satisfy printers, as this metal is always liable to oxidation, and that blocks can never be stored without the taking of precautions which are nearly impracticable if not impossible. Unprotected from the air, zinc becomes rotten on the surface, and the lines, therefore, break when under the platen or cylinder. The drawing of which a block is to be made need only be done in pen and ink on smooth cream-wave white paper, free from wire or so-called "water" marks. A drawing with crayon on grained paper, or any impression of an engraving, may be reproduced. The original is photographed, and a negative obtained, which is printed on a gelatinized plate. The expense of these blocks is said to be about one-half of that of wood engraving.

JAVELLE WATER.—The *Scientific American* gives the following as a simple method of preparing a solution of hypochlorite of lime and soda, known as Javelle water. It is used for bleaching purposes, and has been recommended for removing hypo from prints. It is composed of bicarbonate of soda four pounds, chloride of lime one pound. Put the soda into a kettle over the fire, add one gallon of boiling water, let it boil from ten to fifteen minutes, then stir in the chloride of lime, avoiding lumps. Use when cool. This is good for removing fruit stains from white underwear.

TALC AND THE COLLODION FILM.—In a recent discussion at the Photographic Society of France, on the subject of blistering and slipping of the films in dry plates, M. Divanne alluded to the report of MM. Fortier and Chardon on the use of powdered talc for the purpose of preventing such defects. The method employed is, after clearing the glass in the usual way, to polish it with a piece of chamols leather dipped in finely powdered talc. After such treatment the adhesion of the collodion to the glass is perfect, and neither slipping nor blistering of the film is to be feared. Curiously enough, the same treatment facilitates the removal of collodion films from glass, as in making pellicular negatives.

ARRANGING GROUPS.—In arranging a group, care should be taken to have the line correspond with the circle of the focus of the lens. Arrange a number of chairs in a semicircle, then focus on those in the centre, after which move those on the wings forward or backward till the best focus is secured on the whole; this will show the curvature of the field of the lens, and indicate the form that a group should be, so that, with a little practice, the members of a group can be placed in position at once, and require very little after-adjustment.—*Photographic Times*.

To Correspondents.

JOHN STONE.—A great number of delicate tests have been proposed for ascertaining when the last trace of hyposulphite has been removed from a print after washing; but we are not certain that any test will absolutely indicate the fact. One very simple, although not the most delicate, test is nitrate of silver. If a five-grain solution of nitrate of silver be placed in a test tube, and a portion of the washed print be placed therein, a very minute trace of hypo will cause turbidity and discolouration. A solution of sub-nitrate of mercury is a still more delicate test. A portion of a negative film which has been whitened by bichloride of mercury is a very delicate test, showing discolouration when brought into contact with a very minute trace of hypo. The iodine and starch test is very delicate. You will find it, and several others, described in our various YEAR-BOOKS.

A. B.—Rub the silver stains first with tincture of iodine, about eight grains of iodine in an ounce of alcohol, and then apply a saturated solution of hyposulphite of soda, or a thirty-grain solution of cyanide. This will readily remove fresh silver stains from linen; but if the stains are of some months' standing, it may be more difficult, as from the caustic nature of nitrate of silver it gradually acts destructively on the fabric.

WOLSTENHOLME BROTHERS.—The card forwarded is, with the exception of a little over-printing, very excellent. The light and shade are effective, and the modelling and texture good. We think the general effect would probably be improved if it were printed in an oval medallion of as nearly as possible the full size of the card.

WM. GREEN wishes to know the present address of Mr. Robinson, who some two years ago introduced to photographers a preparation for spotting photographs. We do not remember the address at present. Can any of our readers supply it?

B. W.—We do not know of any such combination to send to India, but will let you know if we ascertain. Thanks for charming prints. They will be noticed in due course. Thanks in advance for article. We shall be glad to receive as soon as convenient.

CHARLES KNIGHT.—The spots on the cards forwarded are due to the bronze powder, into the preparation of which sulphide of tin enters, used in printing on the mounting cards. You should not include questions to the Editor and communications for the Publishers in one letter. It causes trouble, and introduces risk of error and delay.

B. L. D.—The magnesium light affords the best artificial illumination for photographing an object in a dark room. Of course there is the difficulty of getting rid of the white vapour emitted if much time is expended. The best plan is to focus by the light of a lamp or candle held near the object, lighting the magnesium ribbon at the last moment, when all is ready for exposure.

M. F.—So far as we know, the use of carbon printing is extending very slowly amongst ordinary portraitists; but it may be progressing more than we know. It is an important fact to note that the most perfect pictures in the present Exhibition, the charming artistic studies of Mr. Faulkner, are printed in carbon, and that by far the greater proportion of the enlargements, all admirable in quality, are in carbon.

J. F.—Tinfoil may be used for masks; but it has occasionally minute holes, which require to be looked to. Black enamelled paper, or old silvered paper blackened in the light, answers well.

TROUBLED.—Tear drops generally result from a dry horny condition of the albumen, and may be avoided by keeping the paper for a few hours in a moderately damp place before sensitizing. Sometimes the use of a silver bath too strong will produce this defect. When they appear on the sheet in drying, remove the drops of nitrate of silver with a piece of blotting paper.

DORSET.—The Albortype process is not patented in this country, and you are quite at liberty to use it as described in our pages. There is no inherent difficulty in the process standing in the way of success; but patience and perseverance are required, as much of the work is in a new path, and carefully gained experience alone can lead to good results.

A. M. R.—The proportions and general arrangement of your proposed studio are good, and under your circumstances a lean-to form is better than the span roof. Belgian sheet glass will answer admirably. A builder will give you better advice as to strength of the various parts than we can. If possible, partition off a portion of the printing-room for fixing and washing, so that hypo never is used in the same room which is used for preparing paper and toning. The district surveyor of your neighbourhood will inform you whether the non-glazed portions may be built of wood.

W. A. C. A.—The only time we are certainly at the Publishing Office is on Thursday afternoon. We are generally at the early part of the day at home at 36, Canonbury Park South. We shall have pleasure in seeing the negatives and prints.

S. L.—We are obliged by your pointing out what appears to be a mistake. It is not really so, but the case requires a little more fully stating to be quite clear. The weight is, of course, intended to be ounces of 480 grains, which would give a fraction over 9 grains to the ounce; and this, at the time it was written, had reference to landscape work; and the developer would answer well. For portraiture, 20 ounces of water should be used in place of 30, and this would give good results. We are obliged for the suggestion of the addition of the year to each page. It shall receive attention. Your letter was mislaid, and hence a delay occurred in answering.

PHOTO.—The intensity of negatives, or the want of it, depends upon a great number of causes. A common cause of lack of intensity is the use of a newly prepared collodion. Another cause is weak light. Another very common cause with a beginner is applying the developer with force, and driving off the plate all the free nitrate of silver, upon which intensity greatly depends. Many other causes will affect the matter, as bath out of order, unsuitable developer, over-exposure. Try the use of an older sample of collodion, do not over-expose, and apply the developer gently. Alcohol should only be used when the developer will not flow easily over the plate, and the less the better. You may try the addition of twenty grains of sugar-candy to each ounce of developer. 2. The acetate toning bath may be renewed as you describe, or you may renew it with freshly-made solution as at the beginning when it begins to tone slowly. 3. The hypo bath should be made fresh for every batch of prints, and never used twice over. 4. The nitrate bath need not be filtered except when necessary, and certainly not every day. It will, if carefully treated, keep in order for months. Answer to your queries was delayed from causes mentioned above.

Several Correspondents in our next.

The Photographic News, October 22, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. DEATH FROM WASHING WITH CYANIDE.—GOVERNMENT PHOTOGRAPHIC INSTRUCTION IN FRANCE.—THE ROYAL ACADEMY PHOTOGRAPHED.

Death from Washing with Cyanide.—Although deaths from the effects of cyanide of potassium are unfortunately of not unfrequent occurrence, it is an altogether extraordinary circumstance to meet with a case of fatal poisoning with the salt by mere contact. Such an event has, however, but recently happened, according to the *Journal de Médecine de Bruxelles*, and under circumstances that might befall any photographer. That the custom of washing one's hands, after operating, with cyanide of potassium is dangerous, everybody will admit; but, nevertheless, photographers do it every day, and can, therefore, hardly know the extent of the risk they run. In the case we allude to a photographer, having apparently no wounds on his hands, proceeded after his daily work to remove the traces of silver upon his skin in the ready way of rubbing a bit of cyanide over it. During the operation a little piece chipped off, and this lodged underneath one of the nails of his fingers, where there happened to be a little tear in the skin. Immediately a violent pain was perceptible at this particular point, which was rapidly followed by a sensation of giddiness. To free himself from the effects of the poison, he bethought himself of several agents, but unfortunately chose vinegar as a means of giving him relief. The vinegar, however, only made matters worse, and, decomposing the cyanide, liberated prussic acid. The giddiness increased rapidly, feverishness came over the system, his face became pallid, and he was unable to utter a word. In this condition a comrade came upon the scene by accident, and the latter at once called in the assistance of a doctor; but although the patient was revived sufficiently to explain matters, he rapidly became worse, and died in a few hours. Such cases as these are, fortunately for us, very rare, but there cannot be a doubt of the extreme danger one runs under the circumstances. Many operators, we know, think nothing of rubbing their hands after work with a sharp fragment of cyanide, and regard the risk as being too small for consideration; but here we have a distinct case of fatal poisoning due to mere local action of cyanide. Dr. Alfred Swaine Taylor, whose work on poison is well known to every chemist, cites several cases of local poisoning from cyanide, and tells us that the workmen engaged in electro-gilding, who have continually to dip their hands into large baths of cyanide of silver, are constant sufferers. Their hands, he tells us, are almost always covered with ulcers, and there are fissures about the joints through which the blood oozes. Exquisite pain and broken rest are the subjects of frequent complaint among these men. Any photographer who has washed in cyanide solution—and there are very few who have not done so—knows the slimy feeling of the fingers due to the dissolution of the cuticle, thus leaving the true skin exposed, and then contact with cyanide has all the effects of chronic poisoning by prussic acid. There seems to be very little help in such matters, cold effusions, or the dashing of cold water over the spine, being apparently the best course to be taken. Of course, when it is a case of swallowing the poison, an emetic or a dose of solution of sulphate of iron may be administered if one happens to be handy, for the patient after a few seconds loses consciousness, and his jaws become set and rigid; but in the case of local poisoning such a course is of no avail. It is because there is no effective mode of combating its bad effects that photographers should be exceedingly careful in handling the deadly agent, and principals ought not to omit to caution assistants, and apprentices especially, who are usually very apt to have recourse to this ready means of removing stains, of the terrible and rapid action of cyanide.

Government Photographic Instruction in France.—The French Government have decided to foster the study of astronomy in connection with the Bureau des Longitudes, and propose to give particular attention to the matter of celestial photography, spectroscopy, and other kindred matters. With this view they have founded an Astronomical School at Montsouris, which will be under the superintendence of Captain Mouchez, the chief of the Bureau des Longitudes. The students will be exclusively officers of the French navy, half a dozen lieutenants forming the class at one time, and the course of instruction will be limited to six months. In this way a sound knowledge of photography, among other things, will be acquired by the officers of the navy, such as cannot fail to be of value to those who are continually visiting new and strange scenes, of which they will be in a position to secure some record by means of the camera.

The Royal Academy Photographed.—We are glad to see that a course we have urged for some time past has at length been taken in connection with the Royal Academy. We have continually called attention to the circumstance that in Paris the custom of copying pictures exhibited annually in the *Salon* has long prevailed, and visitors could secure a memento of the exhibition in the shape of photographs of those pictures they most admired. In Paris the sale of such photographs is very great, and is, we believe, a notable source of profit both to the artists and the photographic publishers. For the first time this experiment has been made in England this year, and a publication called the Royal Academy Album has been issued in a tentative spirit. The album only contains thirty of the pictures that were exhibited this year at the Academy, but the publication will at any rate be a test as to future steps to be taken. We quite agree with the *Daily News*, when it says, that "the difficulty, however, of inducing owners of new pictures to allow photographic reproductions to be multiplied indefinitely is so notorious, that persons experienced in such matters will perhaps be inclined to wonder both at the number and importance of the pictures which have been produced;" but we think, that now such a publication has been brought out, painters will be offended rather than otherwise, if they do not henceforth see their pictures reproduced in the annual album. It is very certain that of the number of pictures which will not pay to be engraved there is a large number which would give the artist a profitable return if he would but permit them to be photographed, and the copies thus spread about the country would not only increase the value of the original, but also the fame of the artist, by making his name more widely known. Of the hundreds of thousands of visitors who annually visit the Royal Academy, a very large proportion indeed would be only too glad if they could obtain for a guinea or two a small portfolio or album of some of the pictures they like best; and if it was further in their power to make a selection, so that every visitor might carry home just those works which pleased him most, the sale of photographs under the circumstances would infallibly prove a most lucrative proceeding. Apart, too, from their value to ordinary visitors, photographic copies of such paintings would be of especial worth to the student, who could thus inexpensively obtain sketches of the work of different masters. There is no reason, as we have previously pointed out, why every one of us, under these circumstances, should not possess our own inexpensive picture gallery, and have collections of the works of our favourite artists, in the same way as we already possess those of our favourite authors.

FRENCH CORRESPONDENCE.

PORTRAIT AND FRAMEWORK AT ONE PRINTING—HOW TO PRODUCE PELLICLE NEGATIVES—PORTRAITS OF TWO TONES—PHOTOCHROMY AT THE MONITEUR OFFICE IN PARIS. A PRACTISED experimentalist, M. Quesnay, attached to one of the most important provincial establishments (that of

M. Le Blondel, of Lille), has communicated to me the process he employs to make pellicle clichés, such as are of use either for carbon printing or for silver printing, when it is desired to print portrait and framework at the same time. He has also forwarded me some specimens of his work, which are certainly very pretty. In the matter of printing portraits with a framework, nearly every operator has his own particular method, which is more or less simple and perfect; but for my own part I can affirm, from having seen the specimens M. Quesnay sends me, that his process is a most successful one, while, as my readers will see, it is a very practical one also. To obtain the result he aims at, my correspondent makes use of two clichés: the one in the form of a pellicle, and the other upon glass; and it is by superposing these two that he dispenses with one of the printing operations. To produce the first of these negatives, M. Quesnay begins by pouring upon a well-cleaned glass a solution of—

Virgin wax 0.05 grammes
Ether at 65° 500 cub. cents.

which has been filtered through a tuft of cotton-wool. Placed to drain, the plate dries very quickly, the evaporation, especially in summer, being very rapid. In winter time a mild warmth may be used to hasten the drying. When perfectly dry, the film is rubbed gently with a tuft of dry cotton-wool, any dampness having the effect of detaching some of the wax. The rubbing is continued until the plate has become perfectly transparent again. Of course, several plates may be prepared at one time while the operator is at this stage. The plate is then collodionized and sensitized in the ordinary manner, but before placing the plate in the camera, an oval is traced on the ground glass, within which, when focussing, care must be taken that the portrait falls. Then, between the slide of the dark box and the sensitized plate, is placed a paper screen in which an oval has been cut corresponding to that upon the ground glass. In this way the margin of the plate is preserved from the light while the portrait is taken.

When the cliché is finished there is poured upon it, before being varnished, a fifteen per cent. solution of gelatine, care being taken to avoid the formation of bubbles. The thickness of this film should be about a millimetre. When the gelatine has set, it is allowed to dry in a spot sheltered from dust, and then some mattolein is applied, to facilitate subsequent retouching with the crayon; and upon the prepared surface of the collodion is afterwards poured—

Ether at 65° 50 cub. cents.
Alcohol at 40° 60 "
Pyroxyline 2 grammes
Castor oil 2 to 3 drops

The alcohol must always be in excess, so that the film of wax is not dissolved by the collodion. After treating the plate in this manner, four strips of paper are pasted upon it, crossing each other so as not to touch the image; then, with a few strokes of the penknife, the film is cut through, and comes away from the glass.

To produce the cliché with the framework, there is put upon the object which it is desired should serve as groundwork a screen of the size of the portrait existing in the first cliché; then when this second negative is dry and varnished, it is placed above the pellicle cliché and attached at the corners with a little gum, and the printing is conducted in the usual manner. If two tints are required in the portrait printed in silver, you proceed as follows:—

The prints are well washed to free them from all excess of silver, and then they are put between filter paper, which serves only for this purpose. A brush is dipped into hyposulphite solution of twenty per cent. strength, and with this all portions within the oval are treated. The picture is then washed in plenty of water, and put into the toning bath. In this way two tints are obtained, the framework being of a sepia tint, and the portrait of a violet tone. With two clichés produced in this manner it is very easy, says our correspondent, to obtain portraits in carbon without

transfer, the paper which receives the carbon tissue serving as the final support, and the portrait being in its proper sense printed through the pellicle cliché.

There is a second method in which the cliché may be produced without an oval in the slide or in the camera. In this case, when the cliché is produced as in the case of the first cliché, there is placed upon it a sheet of paper for the purpose of preventing creases, and then with the Hutinet oval cutter the pellicle is cut out and transferred to a sheet of mica, to which it is fastened with gum. The same is done for the frame, and in this way the two ovals are produced.

M. Quesnay thinks that these two *tours de main* may be useful to photographers who produce cartes-de-visite by the carbon process, as it is very difficult to make the ovals by means of guiding points, there being nearly always a line of white between the frame and the portrait, unless one employs the printing-frames of M. Lambert and his colleagues.

Photochromy is progressing with giant's strides. It commenced in a little workroom some months ago above the offices of the *Moniteur Universel*, and it now occupies a whole house which has been allotted to it by the directors of the *Moniteur*, who have purchased the sole right to work the process. Machines and apparatus of all kinds have been set up, for the invention has been largely modified and improved since the first, and a large staff of workmen are employed on the work. Orders have already been received from artists, publishers, and photographers who have seen the first examples of the process in the hands of the inventor, M. Leon Vidal. I shall be giving a good idea of the revolution which photochromy has produced when I say that twenty thousand impressions may be struck off at the *Moniteur* office daily, and that their price does not surpass that of the most modest little black print. In a little while the photochromic printing machines will be in full working order. ERNEST LACAN.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XXII.

PRINTING ON PLAIN PAPER—THE FERROTYPÉ—TRANSPARENT POSITIVES.

PLAIN PAPER.

PRINTS on plain paper surpass in artistic qualities those on the albumenized surface—indeed, there is, and ever will be, no doubt, fault found with the highly-polished surface of the albumen print, as being fatal to an artistic production. It will, perhaps, hardly repay us to enter into the discussion, either as protestants against hyper-criticism on the part of artists, or to find fault with a process the beauty of which all must admit, and one, moreover, which has obtained such universal admiration and patronage. Prints on plain paper have their special use, however, as mediums for the reception of colour, chalk, and India-ink.

To salt plain paper.—In a large wide-mouth bottle dissolve 300 grains of chloride of ammonium in 50 ounces of pure water, to which is added 100 grains of gelatine, previously dissolved in a little water by means of heat. This should be thoroughly mixed and filtered, when it is ready for use.

The paper may either be floated on or drawn through this solution. If floated, select the side of the paper having the finest grain, and proceed as in sensitizing albumenized paper, floating ten seconds. The paper should be marked with the pencil on the reverse side, as a guide through the subsequent manipulations.

To draw the paper through the solution, take the paper by two corners and let the sheet hang over the edge of the bath farthest from you (outside), the bath being placed on a high stool or small table. Now draw the edge of the sheet held by the fingers under the solution steadily and slowly, care being taken that all parts are wetted thoroughly. When the sheet is all ~~drawn~~ through, hold the sheet over the bath, to allow and then

hang it up in a warm room to dry. Guard against the formation of air-bubbles.

Do not use the same clips to hang it by as those which hold the sensitized sheets.

The bath should be filtered after use, and kept in a clean bottle ready for the next salting.

The sensitizing bath is similar to that for silvering albumenized paper, the plain nitrate of silver bath 40 or 50 grains strong giving the best results; but it is advised that a separate one be kept for plain paper. The paper has been marked with pencil on the unsalted side, and this side is upwards, the other—the salted side—being in contact with the sensitizing solution. Float about the same time as in the case of albumen paper. Dry thoroughly, and fume ten minutes. Then proceed as in ordinary printing.

Plain paper prints, being generally large, should be treated very gently in the washings, and, to ensure good results, it is well to treat them separately.

THE FERROTYPE.

This style of picture has its admirers, and, from the fact that it may be finished and delivered to the customer within a few minutes of sitting, it has advantages of its own. The picture is a collodion positive made on a black or chocolate varnished iron plate, the colour of the plate giving the gradation of shadow as seen through the transparent parts of the collodion film, the opaque portions of which make the lights.

Collodion.—Most of the ordinary portrait collodions will serve for this positive, except one in which potassium enters, that iodide giving too much transparency. A good collodion for ferrotypes may be made up as follows:—

Iodide of ammonium	...	...	35 grains
Iodide of cadmium	...	...	25 "
Bromide of cadmium	...	...	25 "
Alcohol and ether (each)	...	...	5 ounces
Gun-cotton	...	...	6 to 8 grains

This may be used as soon as it is settled sufficiently clear.

The bath should be forty or forty-five grains of nitrate of silver to the ounce of pure water, slightly acid and iodized as the negative bath. No practice can be more productive of bad results than promiscuously using this or the negative bath for iron and glass plates. They should always be kept to their proper uses. The ferrotype bath can be rectified in the same manner as advised in the case of the disordered negative bath.

Coating the ferrotype plate is an operation exactly similar to flowing a glass with collodion, though a little difficulty may at first be experienced in holding the limp and yielding iron plate; but with practice this is soon overcome. When the film is set it is placed on the dipper, and

Immersed in the bath, the time of sensitizing being judged in the same way as with the negative. It is then

Placed in the carrier (of somewhat different construction to the negative holder), a sheet of glass placed at the back to keep it firmly in its place, and then taken to the camera, and the exposure or exposures made.

The ferrotype camera is generally constructed with a movable back, by means of which four, eight, or sixteen exposures are made on one plate.

Exposure.—This is much quicker than for a negative; speaking roughly, one half the time only being requisite.

The development.—This manipulation requires considerable skill in determining the proper moment at which to stop the development. When this knowledge is acquired it is really easy, as, with the backing of varnish, its progress is more easily watched than is the negative as seen under such varying conditions of transmitted light. The development of the ferrotype is not continued after the first appearance of detail; it is, judging by the standard of the negative, only half developed.

DEVELOPER.

Protosulphate of iron	...	...	1 ounce
Acetic acid	...	...	1 "
Water	...	...	16 ounces
Alcohol (if required).			

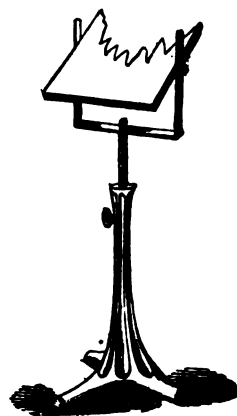
It is well to develop over a large filter and funnel, to catch and preserve the silver; or an old felt hat may be found useful for catching this rich waste.

Fixing.—After being thoroughly washed, to remove all traces of the iron, it is placed in a dipping bath of cyanide of potassium, it being carefully watched to see that the cyanide does not eat away the lights of the delicate film, the perfect clearing of the shadows being all that is required. It is now washed thoroughly. The ferrotype should present purity of lights, with a good gradation of half tones and shadow to the deepest shadows, which should be clear and bright, any veiling or fogging showing that the exposure was too long—of which you can judge by the rapidity of development—or too extended action of the developing action. It can now be dried and tinted.

Drying, tinting, and varnishing.—The ferrotype is now placed on a drying stove, and, when perfectly dry, the cheeks and lips of the picture are tinted with a dry flesh colour lightly brushed on with a soft camel's hair pencil, and dusted off with a blender. Great care must be taken, or the delicate collodion film will be scratched. The picture is now varnished with a clear alcohol varnish, and dried to a glossy surface. Trimmed round the edges, it is placed in a ferrotype envelope, finished.

Ferrotypes may be coloured in water colour if, before drying, they are flowed with a weak solution of gum water, and on this protective film the tinting can be done.

Vignette ferrotypes can be made by interposing a white oval form with serrated edges between the sitter and the



lens at such a distance from the lens that it is entirely out of focus, the toothed edges giving additional softness. In a sheet of white cardboard, about the width of a man's shoulders, cut out a section of a circle and notch it. This is placed in a frame, which allows of its being fixed at any required angle, the frame being placed in a head-rest base, in which it may be moved up and down as occasion requires.

If a vignette is made on a dark background, the vignette board must be so arranged as to be in shadow, to correspond

with the depth of tint of the background.

This may be done by turning the vignette board away from the light, if it does not interfere with the shape of the vignetting, to make it uneven; or, by turning the serrated



edges of the board towards the camera, the usual position

with a white background being with the edges away from the camera. With a little practice any shade can be obtained with the vignetter, and grey vignettes are always to be preferred.

Medallion ferrotypes may be made by means of an oval cut in a large piece of grey cardboard fixed on a stand. This is placed close to the sitter and in sharp focus. One edge of the oval may have a white line marked upon it, and the other edge a dark line, similar to that formed in the printing of the medallion.

(To be continued.)

THE PRACTICAL PRINTER IN AMERICA. XLII.

VARNISHING THE PORCELAIN.

THE porcelain, when tinted, spotted, and the high-lights placed in the eyes if necessary, is then to receive a coat of varnish, which will in a great measure protect the film from injury.

White shellac varnish is necessary for this, because the common yellow lac will spoil the pure white of the porcelain.

* This varnish can very nicely be used in the varnishing of intense negatives.

To make this varnish, first obtain three-quarters of a pound of good white shellac, and place it in a large wide-mouth bottle, in which there has been placed two quarts of the best alcohol. If you are in a hurry for this varnish, you should, previous to placing it in the bottle, break up the shellac in small pieces, placing it (say) in a clean rag, and pounding it with a hammer, or break it in a mortar with a pestle. Shake the bottle until the shellac is dissolved, and if you should see a sediment on the bottom that will not dissolve, you need not be apprehensive of bad results because it does not all dissolve, for this is only the impurities in the shellac, and can be filtered out.

As the beginner can probably flow better from a small bottle than he can from a large one, I should advise the use of a common collodion vial, which will hold about six ounces, and which should be cleaned thoroughly, both on the outside and inside. Into this vial, filter through a couple of filtering papers sufficient of the varnish to fill it up, and you will find the liquid to be of a pale golden colour.

In selecting the bottle, choose one that has a good lip to it, so that when you varnish the plate you can do so without "daubing up" the bottle.

Keep the outside of your bottle perfectly free from varnish, and try to keep your varnish-bottle clean, so that it will look well, and always keep it covered when not in use, by laying a piece of glass over it, or, better still, a ground-glass stopper if the bottle has a neck made for it; but do not stop up the bottle with a cork, as it will in a short time leave bits of it in the varnish. Use a comestless collodion vial if you can.

When about to varnish, hold the plate for a second or so near the fire, for no other purpose than to take the chill from the plate, which you can do without really warming it, for if you were to do that, the varnishing, as before said, would remove the tinting of the porcelain; but if it were only kept near enough to the stove to prevent the plate from being so cold as to chill the varnish the moment it is poured on, it will not then remove the tinting at all.

Avoid getting the plate hot before you varnish it, for you will almost inevitably make a "botch" of it, unless you have had years of experience in varnishing. The varnish, at this time, will also totally remove the tinting and colouring of the hair, although it will not affect the spotting, &c.

Before you commence to varnish, shut the oven door and turn up the gas flame, thus allowing the oven to heat up while you are flowing the plate, so that you can place the plate in it, and dry it quickly, which will prevent the varnish from chilling on the plate before you have obtained heat enough to dry it. Pour the varnish on the plate in the same manner as I have twice before described,

once in the albumenizing, and the other in the collodionizing. Pour the varnish back from the plate into another bottle, and before using it again always filter it.

Pour on the varnish so that you can permit it to run off that corner which is furthest away from the print, because the varnish forms a slight ridge on the two sides, whose vertex is that corner from which your varnish was poured from the plate.

Place the freshly varnished plate in the hot oven, resting it on one corner, and that corner invariably the one at which the varnish was poured off.

Too much varnish on the plate will cause a much larger ridge on the sides than if there was only about the right quantity poured on it in the first place, unless you are very careful in pouring it from the plate.

Wipe out the oven every time you are about ready to varnish a plate, and just as soon as the plate is dry remove it, and place it in a cool (not too cool) place, which place should be perfectly free from all traces of dust.

CAUSES OF FAILURES IN PORCELAIN PRINTING.

Manipulation.—Proper manipulation is the great secret of success in photography, and without it we cannot hope to succeed.

What is it that lies at the foundation of successful manipulation? It is care; and as we are proportionally careful in manipulating, so shall our success be.

The beginner is very apt, unless he is continually on his guard, to get careless in his manipulation, and, in hopes to benefit such a one, I will here give a brief notice, wherein the careful man succeeds far better than a careless one.

I have known a careless toner, when toning a porcelain, to drop a couple of drops or so of the chloride of gold solution into the dish where the porcelain was toning, and instead of placing it in a corner of the dish away from any part of the plate, what worse thing could he do than to drop it in the middle of the dish, where, before he could stop it toning more rapidly at that place by repeated shakings of the dish, it had toned a place full an inch in diameter before it had got so mixed with the rest of the solution that it would not tone so rapidly, and the bright toner would have a chance to shake the contents of his dish well? But it was too late; the toning of the porcelain print needs to be carried no further.

A careful man would have taken the porcelain print out of the dish before he added the gold, and when it was well mixed, he would have placed it back again.

A careless man would not have taken measures to prevent dust from settling on his plate, either during the albumenizing, collodionizing, or the varnishing of the porcelain plate, which a careful one would certainly have done.

THE NEW STUDIO WINDOW.

BY HENRY VANDERWEYDE.*

WHEREVER I have visited the studios of photographers I have generally been placed in the centre of the room, and challenged to admire the quantity of light there thrown upon me; but when I placed myself at either end—in front of the background and in the position of the sitter—it has always struck me how little of the light entering the window fell upon me, or illuminated the background, and that the light was actually wasted throughout the length and breadth of the room. Consequently, when I was asked my opinion in regard to the best form of studio, I was quite at a loss; for, though I had seen great variety of construction while visiting the studios in the North, Far West, and South of America, in Turkey, the heart of Russia, or the rest of the Continent, and even here in the centre of civilization, I had nowhere met with one which showed a thorough understanding of the proper direction of light, and how to obtain it.

In looking over what had been done I found there had

been suggested a very ingenious plan which threw the light towards one end of the room by placing the glasses at different angles facing the sitter; but it has never been adopted, for the very good reason that it confined the sitter to one end of the room, and interfered with the space necessary for the operator and the camera, besides introducing many other disadvantages, not the least of which being that there was no reflected light possible in the room. I hold that a perfect studio should enable the photographer to have both ends of the room illuminated at once, or not, just as he pleases, in order that he may have every possible opportunity for experimenting with every variety and direction of reflected light, as well as to be able to shut off that part or all of the light which does not assist in directly illuminating the sitter, and which he may consider injurious.

Another photographer introduced swinging blinds which would cut all light off from the camera end of the room. This plan was not adopted, because merely cutting off light from one end is not gaining light at the other, and when general illumination of the room was desired, the blinds would have to be taken down.

It is found that by causing the sitter to recede toward one end of the studio a better direction of light and most room to work the camera is obtained. Unfortunately, in proportion as the direction of the light thus obliquely reaching him is improved, so does its quality deteriorate, on account of the reflection and absorption it suffers in passing through the glass at angles of incidence more and more acute.

In Brewster's treatise on "Optics" a table of reflection is given by M. Fresnel. According to this the amount of light reflected from ordinary window glass at the angle of incidence of 40° is 49.10 out of 1,000; at an angle of $56^\circ 45'$ it is 79.5 out of 1,000; at 70° it is 162.67 out of 1,000; at 80° it is 391.7 out of 1,000; at 85° it is 616.28 out of 1,000—thus demonstrating that over half the glass is absolutely useless in transmitting light direct to the sitter.

Another great obstruction is observed by the sitter in the increasing width or side view of the sashes as they recede from him, and, as in this climate we have less good light than in any other, we cannot afford to lose the least amount. I have observed that in England there are many days which must be very aggravating to photographers, for the light is just good enough to take a good picture out of doors or without any window, but in even the best glass house it was impossible. Some photographers have so constructed their window that they can swing a section of it open, thus admitting the pure lights. The objections to this are very evident. Dull weather is too often accompanied with rain, wind, or cold, while soot, smoke, or fog are decidedly objectionable in the room.

To construct a window which will concentrate and throw the purest and clearest rays of light obliquely towards the two ends of the room, and which will avoid all the inconveniences and objections referred to, has been my aim; and, after explaining to you my invention, I shall be pleased to answer any questions or discuss any point with you.

Since the first studio was built on my new plan, several important improvements have been introduced, which will be found in the last one built—viz., at Signor Lombardi's London establishment, 13, Pall Mall East. By arrangement, this studio is permanently thrown open for the free inspection of the profession between the hours of half-past eight to ten o'clock each morning, and from four to six o'clock each evening. [Mr. Vander Weyde then gave a concise explanation of his new system of construction, details of which have already appeared.]

I particularly wish to dissipate a misunderstanding which I have found lately existing. I repeat, that I do not depend upon blinds or shades for concentration of direct rays of light, and that when all the blind cords are let loose, and each spring roller blind rolls up and out of the

way, both ends of the room receive direct, unobstructed light throughout the entire breadth of the window, the quality of the light thus thrown on the sitter being practically the same as that obtained when opening or taking away the entire window. The new construction introduces numerous other advantages never before obtained. By glazing alternately with glass of a yellow tint, one end of the room receives a pure warm light, the other end a comparatively cool light—a great advantage to painters, who can place their object or figure in warm light, while their canvas and paints are always in a cool light, the light in the middle of the room being neutral.

Perfect ventilation, the most singularly complete control, and its novel and symmetrical appearance, make this studio an object of comfort, interest, and pleasure to the public as well as to the artist.

ALBUMEN AND THE NITRATE BATH.

BY SAMUEL FRY.*

ONE ought to apologise to the South London Photographic Society, which takes such special cognizance of the art claims of photography, for bringing before it matters simply of technical or scientific detail; but my excuse must be as before—that perfection in the more material parts of the work leaves the mind free to devote full attention to the artistic claims of the picture.

Probably it may be assumed that a majority—I had almost said a large majority—of photographers give a preliminary coating of albumen to their plates, for reasons which have been frequently given, and various ways have been adopted of applying the substratum. Some use a kind of brush of Canton flannel over a piece of glass; others pour it on whilst the plates are wet; and, again, others pour it on dry and guide it over. Thus we have open to us the traditional three courses insisted upon by a certain politician. But whichever of these three methods may have been selected, a common agreement seems to have been arrived at, that it is a *sine qua non* that no albumen shall under any circumstances be allowed on the back of the plate, because it will fog the bath.

I remember reading in one of the journals the experience of an operator who inadvertently put some plates in his bath after coating with collodion the unalbumenized side. He described his bath as entirely out of order next day, although working well for a few hours after the mishap.

Finding the labour of wiping the superfluous albumen from the backs of plates very onerous, I thought I should like to know just what would be the effect of albumen in the bath, and I therefore set aside one bath and six dozen plates prepared by pouring on albumen whilst the plate was wet, and in all of which I was sure the albumen went over the back. I had a theory as to what the result would be, and it turned out just as I expected, and contrary to what we have always been told—the albumen has no effect whatever.

Three weeks have elapsed, and about nine dozen half-plates prepared as stated have been through the bath of about eighty ounces, and it works just as well as ever, perfectly clear in the shadows and full of harmony and half-tone. The rationale is obvious: the bath is a strong one—forty grains—and at once coagulates the albumen, which becomes immediately innocuous. I can imagine that if a weak bath were used the results might be different, solution of the albumen occurring, and organic disturbances being created.

It is, of course, possible that a simpler cause may exist for the non-effect of the albumen in the film being quite desiccated, and requiring longer for its solution than the time occupied in the bath by the collodionised plate.

* Read before the South London Photographic Society.

The Photographic News.

Vol. XIX. No. 894.—OCTOBER 22, 1875.

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THE PROGRESS OF CARBON PRINTING.

IN another column we print a letter of unusual interest and significance, recording certain very definite steps in the progress of carbon printing. A gentleman on the staff of the PHOTOGRAPHIC NEWS, in a recent article deploring the prevalence, in every direction, of silver prints which were "sicklied over with the pale cast" of sulphur, which is too often but the premonitory symptom of total fading, expressed a conviction that not a single photographer of note had as yet discontinued the use of silver printing entirely. Our contributor admitted, at the same time, that whilst it would puzzle most photographers to say how photographers might secure permanent albumenized prints, the public were growing so distrustful of photography, that whilst they would readily give five guineas for an engraved picture, they would hesitate to give five shillings for the same thing in the shape of an albumenized print which might turn yellow in twelve months. A more damnnatory opinion in regard to silver printing could scarcely be expressed, and much too nearly true. Recognizing this as a fact, it is inexplicable beyond measure that the adoption of carbon printing has been so slow amongst photographers generally. There is probably not a photographer in the world who can conscientiously say that he has never seen one of his own silver prints turn yellow, and scarcely one who will undertake to say that the fading was a mere accident which shall not happen again; or would venture to guarantee the permanency of any batch of silver prints he sends out. Yet such is the persistent conservatism of photographers that, notwithstanding that permanent printing in carbon has been a practicable process for ten years, and for the last five years facile as well as practicable, until very recently there appeared to be but little prospect of its general adoption.

Our correspondent points out some facts of a very reassuring character, and indicates several photographers of position who have given up silver and adopted carbon, and this not in small establishments, where a limited amount of work is done, but on a large scale. Mr. Hughes, as many photographers know, has one of the largest and best appointed studios in the kingdom, where, besides an exceedingly busy season, an extensive business in portraiture is done throughout the year; and during the busy season he has ventured to give up silver and adopt carbon: some examples of the carbon work recently done in his establishment certainly lacked nothing of the beauty, either in delicacy or brilliancy, of silver prints. Besides those

establishments in Belgium and France,* mentioned by our correspondent as having adopted carbon printing, we may mention the establishment of M. Braun, of Dornach, from whence has issued for years those magnificent large reproductions of works of fine art. There is the photographic department of the Royal Arsenal at Woolwich, where, we believe, carbon printing has been solely used for some years. At Chatham, the Engineer photographers under the charge of Captain Abney use carbon, we believe, extensively. Mr. Sarony, of Scarborough, we believe, uses carbon to a considerable extent. How many photographers there are who, like Mr. Faulkner, do their best work on carbon, we are unable to say. Finally, the great pioneer carbon establishment of the world, the Autotype Company, is doing the work which pioneers have ever had to accomplish. They are working steadily to show the way to photographers. That the community and the art will benefit, there cannot be a doubt; and we hope and believe that the pioneers themselves will reap a great commercial success. The admirable display of permanent prints, equal in all respects to silver prints, at the present Exhibition, will aid, we hope, to call public attention to the subject, and create a demand for photographs produced in permanent pigments, to which photographers, in spite of their habitual conservatism, will readily and gladly respond.

A TRAP FOR PORTRAITISTS.

A COMMUNICATION sent to the Photographic Section of the American Institute describes a trap for portraitists which, it seems, has been tried in America with, we hope, but little success. Few respectable photographers would deliberately undertake indecent portraiture, but the snare described here is one into which many might innocently step. The writer, who signs himself "Amateur Detective," styles the scheme the "Tight-fitting Corset" applied to photographers. He says:—

"This is a new confidence game requiring four or more persons to play the same. First person: a dare-devil or saint, as the occasion may require. He engages his mistress to visit galleries and obtain immodest, nude, or indecent pictures, first by asking for decent ones. Then she says she is agent for the 'Patent Tight-fitting Corset,' and wishes to show it practically. Then a half-nude is wanted, to illustrate the difference, only to show to the customers. She sometimes gets one to sell her beau, without the above laboured plot. The first man, when he has got a collection of the pictures, requires the kind help of a partner, or third person. He visits the photographer, and gradually discloses his errand—viz., to inform him, in pure kindness, that he accidentally overheard the threat of an old pious man who has a wayward boy, with whom he has found the said pictures, to prosecute those who made them, and has got the girl as a witness. This third person advises the photographer to call and see the said old gent., and try and beg off. It is an unpleasant matter to be locked up for crime, perhaps long delay in coming to a trial, ruin to business, &c. This third person has no name or place of business to give you, don't want to be mixed up in the affair, don't ask any remuneration, but will take money to defray expenses. The old gentleman is a myth—is number one. The fourth person in this little game is the photographer, whose dollars are wanted, if he can be scared by old blackmailers, who manufacture crime and compound felonies on their own terms.

"The President remarked that if there is any game like this being played on photographers it should be known to the profession, so that when persons come to their galleries to have pictures taken with the 'Tight-fitting Corset' they can be dealt with accordingly. Photographers are an innocent class of men, and would not readily suspect anything of that kind."

* See Dr. Vogel's letter in our next, mentioning the public demand for carbon prints in Brussels.

THE PHOTOGRAPHIC EXHIBITION.

LANDSCAPES.

LANDSCAPE photographs constitute a very important feature of the present exhibition, nearly half of the contributions belonging to this department of the art. Whilst in portraiture the wet collodion process alone appears to have been employed, we have in the landscape examples of various processes, wet, dry, and emulsion, and excellence, even the highest excellence, is not confined to any of them. The oldest dry process,—the Taupenot, and the newest,—bromide emulsion, may be said to run neck and neck with wet collodion. The question of convenience can therefore present the only determining motive in making selection, and from the prevalent use of the wet process amongst professional photographers, at present it seems to possess the balance of advantages.

There are not many new exhibitors in this department challenging public attention for their work. Amongst those few, however, Mr. Crawshaw most prominently attracts attention. We believe he has once before exhibited one or two views, but to the present exhibition he has sent several landscapes of a degree of excellence which fairly competes with that of his fine portraiture. Probably there is nothing in the room finer than his "Waterfalls at Torpanton" (83), which is in every way—selection, lighting, and general treatment—exceedingly successful. In No. 81, the "Cyfarthfa Limestone Quarry," we have an example of the skilful pictorial treatment of an unpromising subject. No. 82, "The River Usk," and 84, "Scethrog Hill," are also very fine, as are several other of his landscape contributions. Amongst comparatively recent landscape contributors, we find Mr. E. Viles, who last year for the first time contributed some, but this year has made considerable advance, and sends some exceedingly good work. His pictures are large, about twenty inches by fifteen, all technically good, and some possessing considerable picturesque excellence. There are different views of Moreton Corbet Castle, and Long Church, in Salop, which are very fine indeed.

We have especial pleasure in seeing the photographs of Mons. Davanne at the present exhibition. His name is one of the oldest and most honoured associated with photography, and his contributions to photographic chemistry, varied and extended, stand amongst the solid possessions of the art. Photographers in this country are familiar with his labours in building up photography as a science, but until now have had no opportunity of seeing his pictorial work, and they will be delighted to find that the productions of the artist do not discredit the savant. Mons. Davanne's pictures are on twelve by ten plates, and produced by the Taupenot process. They admirably show that this oldest of dry processes is no whit behind the most modern. Singularly delicate, very brilliant, and full of gradation, spotlessly perfect in every way, they are admirable examples of technical photography; and besides that, the selection, lighting, and treatment, are all dictated by artistic feeling. It is not a little complimentary that the vice-president of the French Photographic Society, in contributing to an English exhibition, points out that his work is produced by the lens of an English optician, the front combination of the No. 1 rectilinear lens having been used in producing these large pictures.

Also from dry-plate negatives—the beer and albumen process having been used—are the curiously fine Egyptian photographs of Captain Abney. We have referred before to a special peculiarity of these pictures: their singularly luminous character; the sense of brilliant light, and the absence of black shadows; the sense of life and movement in the rushing waters of the First Cataract on the Nile; the feeling of colossal grandeur in the Rameses at Thebes, standing out bold and solitary against a very poetic sky. Near to these are examples of another dry process, in the prints from emulsion plates by Mr. Henry Cooper, a

series of cabinet gems. Presumably by an emulsion are the Isle of Wight views by Mr. Stillman, which are somewhat grey and flat, and not equal to some former work he has exhibited. Mr. Mawdesly, in his examples of emulsion work, does himself less than justice. In the three large frames full of cabinet views there is much admirable work, and many of the single pictures are excellent; but the whole in each frame leaves an unsatisfactory impression. This is mainly due to two causes: the prevalence of white skies, and the large amount of margin of intense buff mounting-board, which kills the photograph, and gives a quality of weakness to prints which, better treated, would look well. The pupils and assistants of Captain Abney, amongst the Royal Engineers at Chatham, contribute as a body, and send some of the finest landscapes in the exhibition, presumably by the beer and albumen dry plate process.

Rarely equalled, and probably never surpassed alike in technical and art qualities, are the landscapes of Mr. Bedford—and, let it be noted, it is Mr. William Bedford, son of Mr. Francis Bedford, who is the exhibitor. The work of the son possesses all the traditional excellence of that of the father, which is the highest praise that can be awarded. There is a singular perfectness of finish in all his landscapes at the present exhibition, which is suggestive of the minute care seen in a fine miniature painting, but this is attained without any sacrifice of breadth, or space, or atmosphere. There is perfect definition, without any suggestion of cutting hardness. The sky effects, which are admirable when separately examined, never obtrude themselves, but are simply a part of the picture. The prints of this year are of an unusually fine black tone, closely resembling an engraving. Possessing much of the same uniformity of excellence are the views of Scottish scenery sent by Mr. G. W. Wilson. His contributions of this year are somewhat larger than the sizes he has before exhibited, and the proportions are very effective, being about ten or eleven inches by seven inches. Mr. Stephen Thompson sends a number of fine interiors illustrating old English homes, and the landscapes he is issuing under the title of *Studies of Nature*. They are well chosen and well treated. A peculiarity of these interiors is the extent of angle included, so as to give a really pictorial presentment of a room, and not merely a fragment of one. Mr. Thompson says his aim was to give such a view of the rooms as Nash would draw—a high and difficult aim for photography—but Mr. Thompson has not come far short of his aim. The negatives are produced, we are told, not by a double or triple combination, but by the wide-angle landscape lens of a well-known London optician. Amongst the most pleasing and artistic landscapes are two or three small pictures by Mr. William Brooks, whose contributions, it is to be regretted, are not more extensive. Mr. Mundy's New Zealand landscapes have been noticed before: they are full of interest, and possess high excellence.

There is an unusually fine show of cloud pictures at the present exhibition. Messrs. B. Wyles and Co. send two or three frames entitled "Cloudland," with every variety of sky effect: clouds heaped in grand cumulo masses; clouds driving before a swift wind; clouds heavy, sombre, and still; clouds twisted in fantastic wreaths, and clouds with gilded edges behind which the sun goes down; all full of suggestion and full of poetry. Mr. Stoddart, of Margate, also sends some capital cloud scenes and sunsets with not less poetry and beauty, and some of them on large plates are very impressive and fine.

Mr. F. M. Sutcliffe's contributions come for the most part under the head of art studies rather than simple landscapes; but we may mention his *Beech Trees* (357) as an unusually fine rendering of foliage. His *Pine Trees* (318) are rather too heavy even for the gloomy depth of pine foliage. Captain Turton sends some views on Ouse, and some groups of cattle, possessing high artistic merit. They are, we believe, carbon prints from 12 by 10 nega-

tives enlarged from small negatives on Col. Wortley's plates. Mr. R. Mitchell sends some views in Arran which admirably render the grand and glowing scenery of this wild Scottish isle, and some other studies all characterized by the picturesque spirit which distinguishes his work. Mr. F. Salis Schwabe sends some very fine views of scenery in the West Highlands and Skye. The photography is almost too delicate and perfect to render full justice to the abrupt wildness of these desolately grand scenes, but the photography is very excellent indeed. Mr. Brownrigg, of Dublin, contributes several of his capital landscapes; those of Wicklow scenery are especially beautiful. Mr. W. G. Hunter contributes a number of charmingly delicate and picturesque renderings of Welsh and English scenery. His mode of mounting the prints in optical contact with the glass is very effective. Mr. H. Whitfield sends some small landscapes of singular delicacy and much artistic feeling.

To some other landscapes worthy of notice we must refer in our next.

PORTRAITS WITH CLOUDED MARGINS.

AMONG the novelties in the United States are vignettéd portraits with clouded margins. The cloud negatives are prepared by M. Bigelow, and sold through the Scovill Manufacturing Company. Here are Mr. Bigelow's instructions for producing the portraits, as given in the *Times*, which may interest some of our readers:—

"First construct a light frame 14×17 inches square; then take a piece of dark green window-shade paper (or any dark paper nearly black), dampen it by floating on a dish of water, and glue to the frame. When dry it will shrink so as to be perfectly flat, and even if you work with a 4-4 tube, take a matt with oval opening about six inches the long way, and mark the oval on the paper you have stretched upon the frame; then lay it on a piece of glass, and cut out the opening with a sharp knife, cutting it in half-inch notches resembling saw teeth. With this screen placed about two feet from the camera, between the camera and sitter, adjusted so as to show the sitter through it, proceed to take the negative, which will come out with a dark margin or dark vignette. Now place the cloud negative in the printing-frame; then lay the vignettéd negative you have made upon it, place the sensitive paper as usual, and close the frame. This brings the cloud negative upon the outside. Print as usual. If you wish the clouds sharp, print with the varnished side of the cloud negative next to the portrait negative, and face directly towards the sun. If the cloud effect is desired softer, print in the shade, or by turning the film side of the cloud negative out.

"If you use a half-size lens, use a smaller opening in the vignetting screen. Support the screen by a light framework on castors, and constructed so as to be adjusted at any height. Make the position and focus before placing the vignetting screen. I find it quicker and easier to adjust the screen by the reflected image of the sitter seen upon the front lens of the camera. It will take but a moment's time to adjust everything after a little practice.

"If the clouds print too light, use a darker screen; if too dark, use a lighter one. Use any background from medium to dark shade."

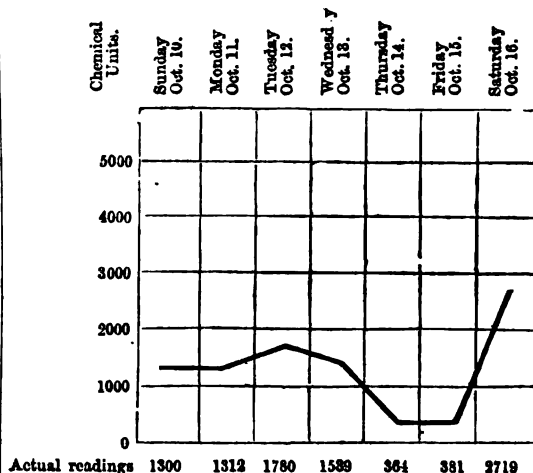
METEOROLOGICAL REPORT OF THE DIURNAL AGGREGATE OF CHEMICAL FORCE IN THE DAYLIGHT OF THE SOUTHERN SKY,

FROM OBSERVATIONS MADE AT BLACKPOOL, LANCASHIRE.

BY D. WINSTANLEY, F.R.A.S.

THE daily average of chemical force has risen during the past week to 1,342 chemical units, or 400 units more than the daily average of the preceding week. Saturday was a remarkably fine day, scarcely a cloud in the sky all day, and the atmosphere free from mist. The fact of the aggre-

gate of light falling short of 3,000 units, even then, is accounted for by the gradually diminishing altitude of the sun, and the gradually increasing shortness of the days. I should think it very improbable that during the next five months a daily aggregate of over 3,000 units will ever be attained.



NOTE ON DEVELOPMENT.

BY ROGER LAURENT.

(Aux Forges des Basses Indre, Loire Inferieure).

IN the hope that it may be interesting to your readers, I send you my method of developing the photographic image, the plan being one which certainly gives a cleaner, clearer, and finer cliché than can be obtained with iron. My formula is:—

Filtered water	...	100	grammes
Pyrogalllic acid	...	1	gramme
Acetic acid	...	1	grammes
Alcohol	...	15	

As every photographer knows, solutions of pyrogalllic acid will not keep very long. Into a bottle I put half a gramme of pyrogalllic acid, with 50 grammes of water; into another I put also 50 grammes of water, with 15 grammes of alcohol and 4 grammes of acetic acid. These are the two solutions that I use.

I expose at least double the time which would be required to give me a good result with an iron developer, and on withdrawing the plate from the camera I set it down upon filter paper. I pour into a glass a little of the alcohol-acetic acid solution, and this I throw upon the plate exactly in the same way as I should an iron solution, the liquid being applied two or three times. The solution is then returned into the developing cup, and to it is added an equal quantity of pyrogalllic solution from the other bottle; and the development of the image is then proceeded with, with this mixture, until the negative is properly finished.

To intensify the cliché, if it is necessary, I put into the developing cup some fresh solution, together with a few drops of a three per cent. solution of silver. As the pose is longer than usual, clichés upon dry plates are still better.

A ROLLING STONE'S VISIT TO PEKIN.

BY D. K. GRIFFITHS, SHANGHAI.

ON my way from Shanghai to Pekin I broke my journey at Chefoo, a delightful watering-place in the province of Shantung, the classic grounds of China, and remained one week to strengthen myself for the fatigues of Northern travel, and then finished my sea journey to Tientsin.

The weather was wet, and I was too anxious to proceed to break my journey at the mouth of the river Pei-ho, so

as to get a view of the Ta-koo forts, neither was their appearance such as to decoy one into the trouble of unpacking chemicals and apparatus for a photographic shot at them; their low mud walls present a very unimposing frontage, and would make an indifferent view even under a more favourable condition of the weather. We anchored opposite for some time, waiting high tide to get across the bar, which was effected after an hour's detention, and succeeded in getting up the river as far as the "double bend," when the vessel's bow went fast in the mud projecting well over a "Paddy" field (rice-field), and here I availed myself of an offer from the Custom's official to get into his boat for a pull to the town, which we reached by nightfall.

Tientsin is a poor-looking mud-built place, the foreign hongs (houses) of the Bund its only attraction; and the country being inundated at the time of my visit added to its desolate appearance. I put up at the only foreign hotel in the place, a mud one-storied shanty, but what I found wanting in bricks and mortar was well compensated for by the genial hospitality of the residents.

After taking a view of the "Treaty Temple," and the scene of the massacre, these being the only points of interest, I got my passport from the British Consul, hired a native house-boat, and secured the services of a Pekin boy to act as interpreter, who, with my Shanghai boy, cook, and chair coolies, completed my party.

The boat, a large one, was worked by six sturdy coolies in a state of perfect nudity, and starting with the tide in our favour, we were soon past the Bridge of Boats, and on the highway to the Capital.

I journeyed on as far as Tung-chow by the canal, where I was obliged to change my mode of travel, hiring ponies and mules for myself and the interpreter Ahee, with wheelbarrows for the provisions, photographic stores, and apparatus. While these were being engaged, I entered a native inn, to get out of the crowd attracted by a sight of the "yang-quitza" (foreign devil), but many of them followed me to the room provided for travellers, and as they were very quiet, I submitted to the offensive odour of the proximity, indulging their curiosity to examine my breech-loader and the various other foreign articles and stores. One old lady ventured to taste some bitter beer, mistaking it for brandy, that some previous traveller considerably made her acquainted with, and deeply reverential were her salaams when I corrected the error.

When everything was in readiness, I started the wheelbarrows on the paved road, preferring that sort of vehicle to the carts, as more easy to be guided by the deep ruts, and so save the apparatus and photographic material from certain destruction. Leaving them in charge of my Shanghai boy and coolies to proceed leisurely, I started with Ahee as guide across the more pleasant cotton fields; two hours' quiet riding brought me in view of the walls of Pekin, and from their fine proportions I was led to expect a vast labyrinth of wealth and greatness within. Riding across the bridge over the moat, through deep ruts in the pavement of its time-worn gates, amidst clouds of dust, heat, and stench, I entered Pekin, and rode through the streets keenly criticised by the crowd, who kept up a cross-fire of questions with Ahee. The wide streets offered no shelter from the scorching sun, and the dust was very troublesome, so it was with great relief of mind and gratitude of heart I reached the hotel, and for the first time for four days I was able to sit down to a comfortable dinner, and enjoy the luxury of a bed.

I now called upon Mr. Wade, H.M. Minister, who kindly interested himself in my plans, and obtained for me, in addition to the British passport, one from a high Chinese functionary; indeed all the ministers in Pekin representing the several nationalities offered every assistance and valuable suggestions, so as to leave my excursions in the surrounding country as free from danger as possible, for it is very apparent to the most superficial

observer that a strong anti-foreign feeling pervades the masses, more especially the inhabitants of cities; and Pekin is no exception to this rule.

In this far-famed Eastern capital, wherever you turn the mind reverts to the past; the only thing that recalls you to the Pekin of the present day is the passing crowd, the bustle of its busy throng, and the dull rattling noise of its springless carts, as they pass you by in the lazy humdrum of Chinese life. The streets are wide, with a high raised road in the centre for carts; in dry weather this road consists of dust, and in the wet weather of mud, the heavy carts sinking well up to their axles, and making deep tramways of their route. In most places the streets are narrowed by temporary bamboo shanties, erected for the convenience of old clothes dealers, or cook shops, the proprietors of which, by rattles, or the more primitive efforts of the lung, call the vain or the hungry to a knowledge of their wares.

I spent a month and a half in this centre of China as it is and China as it was, and wherever I went was disappointed in not meeting with any of those scenes so indulgently bestowed upon it by artists of the past, whose pencils have delineated lofty domes and minarets, with convenient river foregrounds, where massive and picturesque junks rest upon the placid waters, and subdue by their shadows its light serenity. Alas! for the photographer, who must be satisfied with the sober reality, and cannot fling in an odd fancy or two, so as to add a charm to views so uninteresting, for excepting the moat round the walls, and a stagnant pond the olfactory nerves could well dispense with, my matter-of-fact vision rested not upon those dearly cherished scenes.

Such as it is, not as it might be, Pekin was there, a dull vacuity of any such fancies—a dusty, dirty hive of animated littleness, the few temples in it, which are only to be found by indefatigable industry, its only pleasing features; these temples, from their unique style, will naturally arrest the attention of a European traveller diverting his mind from what is to what was, and while in Pekin this is his most happy state.

The chief places of interest are to be found in the Tartar city, from the walls of which I made negatives of the imperial or "prohibited city." I had many besides photographic difficulties to overcome in getting a collection of views; I had to contend with the superstition of the people, and their ingenuity to annoy and "squeeze" me in every possible way. Very often hours were lost getting coolies courageous enough to carry the apparatus and necessities, and when they were started a sudden fear would sometimes seize them, and they would try to shirk the journey altogether by pretending ignorance of the road, the boy often being an accomplice; great firmness, and sometimes even a display of force, must be resorted to before they act on the *mot d'ordre*.

(To be continued.)

Correspondence.

YELLOWNESS IN SILVER PRINTS.

SIR,—In an article on the above subject in your last week's issue occurs this sentence:—"It will never do to give up altogether so beautiful and delicate a process as silver printing, and it is simply nonsense to talk about its rapid decay during the last few years, for there is not a single photographer of note in this country—nor, we believe, in any other—who has discontinued the process entirely." This is not far from the truth; but allow me to give the commentary of some recent experience which seem to betoken a coming change.

Some few months ago I had the pleasure of making the acquaintance of MM. GÉRARD FIÈRES, of Brussels, and was with much courtesy shown by the brothers over the whole of

their establishment. The premises are in the central part of the town; the entrance, with handsome plate-glass front, is modern, but the reception room, workshops, and interior generally are in a fine large old-fashioned style, commodious in the highest degree. The studio is a vast apartment, well lighted, fitted with antique furniture and tasteful accessories, and, both for work and appearance, almost superb.

The maison Gérusset is quite in the front rank of Belgian photographers, and for more than twelve months has totally discontinued silver printing in favour of carbon. I saw the arrangements for sensitizing the tissue, witnessed the exposure, development, and mounting of the prints, and observed a very excellent average of work produced. The ateliers of MM. Gérusset are fitted with appliances to produce negatives up to thirty-six by twenty-eight inches, and from this size to the smallest miniature every picture is printed in carbon. As far as my information extends, to these gentlemen is due the honour of being the first photographers in Europe to issue nothing but permanent photographs.

I made again, during the last days of the "Exposition Belge de Photographie," a flying visit to Brussels, and found MM. Gérusset very well satisfied with the commercial results of the steps they had taken. It may be noted here that out of the twenty-three Belgian exhibitors, eleven showed examples in carbon: one frame of whole-plate portraits without glass, by Zeyen Liege, was a most noteworthy example among much that was excellent.

Before quitting Belgium I made a call on M. Joseph Maes, of Antwerp, who is a noted carbon worker, and possesses a fine collection of negatives from the paintings of the Dutch and Flemish schools. As a matter of choice, M. Maes issues only permanent prints; but, as a question of commerce, fears, until public opinion is more pronounced, to discard silver entirely. Prints from the same negatives are obtained by both processes, and may be found in the shops side by side, the carbon prints being sold at a higher price.

Last month I was shown over the dwelling and the ateliers of M. Liébert of Paris: the whole premises—built specially for photography, and furnished with an elegant magnificence: dining and drawing-rooms, handsome entrance and staircase, courtyard and offices on the ground-floor; two splendid reception rooms, bureau, billiard room, terraced garden, and fine studio on the first floor. The arrangements were most convenient and complete, and a large business doing, without the aid of silver, save for the negative bath and the actinometer paper. In the development room was an English operator at work. He had tanks for hot and cold water, alum bath, &c., and before him a pile of pieces of plate-glass, each holding nine cartes, four cabinet or larger prints, that after exposure had been applied to the waxed and collodionised plate, and now waited development. After a little soaking in warm water, the paper backing of the tissue was peeled off, and the latent image speedily washed up to the required vigour, the exact point being a matter of judgment, and determined by examining the transparency while held over a sheet of white paper. In the next room I observed a strong rack carrying some forty of the large glass plates, each with the developed pictures, waiting to be spotted and touched before application of the transfer paper and removal from the glass. The negatives produced by M. Liébert are of a high order, and printing seemed to proceed steadily and without a hitch.

For a more recent instance, one nearer home and of a salient character, I cite a well-known name: Mr. James Hughes, of Ryde, showed me, within the last few days, specimens of cabinet prints in carbon, that for brilliancy, purity of tint, and delicate gradation, left nothing to be desired. He assured me, with a look of modest triumph, and a sweet calm of conscientious photography in his face, that for two months he had discarded silver printing, and issued only work in carbon. Mr. Hughes had even ventured on this revolutionary procedure in the very height of the season, and although this had thrown his

work into arrears, saw nothing to regret. To be the first photographer in England able to guarantee the permanence of all his work may possibly be an achievement not without result in both honour and reward. It remains to be said that in Mr. Hughes' opinion it is only by the recent ingenious developments of carbon printing by Mons. Lambert that so radical a change in procedure at Ryde has become safe, or, perhaps, possible. Processes thus adopted into commercial, every-day use are not without distinct significance to the profession. W.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE opening meeting of the present session of this Society was held on the 11th inst., the Rev. F. F. STATHAM, M.A., President, in the chair.

The CHAIRMAN said that it would be desirable if in future members would come forward with brief papers. He wished it to be understood that long and formal papers were unnecessary, short ones very often forming a theme on which to hang an interesting discussion.

Mr. VANDERWEYDE read a paper on "The New Studio Window" (see page 508.)

After some remarks by the Chairman, who thanked Mr. Vanderweyde for his paper,

Mr. AYRES asked if groups as well as single sitters could be taken in a studio lighted by the system advocated, because it seemed to him that owing to the light being strongest in the centre, those of a group situated at the side would be imperfectly lighted.

Mr. VANDERWEYDE said that there was no difference in the strength of the light within two or three feet of the sitter.

A general conversation ensued, in which Mr. James Hughes, Mr. Spiller, Mr. Fry, Mr. Wilkinson, and others took part.

Mr. VANDERWEYDE replied to several questions, asking explanations, by making drawings on the black board.

Mr. SAMUEL FRY then read a paper on "Organic Matter in the Nitrate Bath" (see page 509.)

Mr. SPILLER enquired of Mr. Fry if his nitrate of silver bath never became discoloured by the presence of albumen.

Mr. FRY replied that it remained colourless.

Mr. TAYLOR said that in the albumen process on glass the bath became of a deep brown colour, and enquired if Mr. Fry could explain the cause of his exemption from such discolouration.

Mr. FOXLEE observed that in the albumen process not only was there a deep discolouration, but it arose when working with a very strong bath.

Mr. FRY was well aware of the fact, but he was unable to offer an explanation of it.

Mr. WILKINSON found that when plates coated with albumen were damp they frequently fogged; but if the albumen were rendered quite dry no fogging occurred.

Mr. HUGHES said that the fogging was caused by the action of the nitric acid on the albumen. Soon after the introduction of the Taupenot process he tried albumen in the bath, under extreme conditions. Delighted with the fine rich tones obtained by that process, he gave his plates a coating of albumen, followed afterwards by one of collodion; but, after a few days, fogging resulted, which caused him to prepare a new bath every week, which, owing to the beauty of the results obtained with albumen, he willingly did for a time; but, eventually, discontinued that practice.

Mr. FRY said that, in his own case, the albumen film was very attenuated, and quite dry: the proportion of acid in the bath, too, was considerable. At occasional intervals he boiled his bath.

After a vote of thanks to Mr. Fry, and the transaction of some routine business, the meeting adjourned.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE annual meeting was held at the Memorial Hall on Thursday evening, the 14th inst.; W. T. MASELY, Esq., President, in the chair. The minutes were read and confirmed, and the Secretary read the

Annual Report.

The session of 1875 closes the twentieth year of the existence

of the Manchester Photographic Society, and your council hope, and have reason to believe, that during the twenty years of its active life it has been instrumental in forming many lasting friendships, and productive of some photographic benefit to its members generally.

The past year has not been distinguished by any special feature, and the Society may be said to be in about its normal state. While a slight improvement has manifested itself in one direction, a little falling-off has been apparent in another. But so it must ever be, and your council can only make the best of the circumstances in which they may find themselves placed. There are at present seventy-seven members on the register, and two nominated for election, against seventy-six members at the last annual meeting; but the average attendance during the year has been only twenty-eight against thirty-one in the year just completed.

Although the papers contributed during the session have been but few, the meetings have been far from uninteresting or uninteresting, and this is, no doubt, a matter of congratulation.

The President read a new paper on a good old subject, "Printing by Development," illustrated by an exhibition of the process.

Mr. John Brier, jun., read a paper on "The Production of Enlarged Landscape Negatives," with illustrations.

Mr. A. Brothers, F.R.A.S., explained in what way the photographic methods had been utilised during the transit of Venus, illustrated by numerous diagrams.

Mr. Noton read a paper "On the Manufacture of Nitro-Glucose," followed by a supplementary statement and experiment at a subsequent meeting; and the active session closed with a lantern exhibition of choice pictures kindly lent by Mr. F. York, of London.

Your council, in thanking those gentlemen who did their best for the Society last year, beg to express a hope that they will renew their efforts in the year to come, and that many other members will follow their very good example.

The annual report was accepted, and Messrs. Jas. Young and Wm. Cleary were elected members of the Society.

The following gentlemen were elected to fill the various offices for the year:—*President*: W. T. Mabley, Esq.—*Vice-Presidents*: Messrs. A. Brothers, F.R.A.S., M. Noton, Thos. Haywood, Rev. Canon Beechey, M.A., and G. T. Lund.—*Council*: Messrs. Jno. Brier, jun., W. G. Coote, A. Coventry, John Holding, A. Paterson, J. B. Payne, I. Wade, John Warburton, N. Wright, and J. C. Sewell.—*Treasurer*: Mr. J. H. Young.—*Secretary*: Charles Adin, Clifton Bank, Wellington-road, Whalley Range, Manchester.

Mr. J. B. Forster read an interesting and instructive paper on "Art in Photography, and the late O. G. Rejlander" (which will appear in our next), illustrated by some of the works of the deceased artist.

The Secretary laid the *Bulletin* of the Belgian Association of Photography on the table, and collected the sum of £6 12s., which he hoped to make up to £7 12s., towards the fund in aid of Mrs. Rejlander.

The meeting was then adjourned.

Talk in the Studio.

IMPROMPTU, on seeing the picture in the Photographic Exhibition No. 124, "Belle and Bow," by Chaffin and Sons:—

"This fair Toxophilite has so arch an eye,
No need has she to sport with archery!
With gauntlets and with arm-guard garnished so,
In every contest she could win a beau."

"Her well fletch'd arrows, sure, would 'hit the mark,'
And fly as swiftly as electric spark!
Such eyes as hers the sharpest darts can throw:
I am not Chaffin, but she needs no bow."

J. H. JEWELL.

EVANOFF AND GODDARD.—[In the notice of the Photographic Exhibition in our last, the excellent portraits of Messrs. Evanoff and Goddard were, by a printer's error, mentioned as by Ganoff and Goddard.

TRADE MARKS.—One of the most important Acts of last session, in its bearings on commercial interests, is "The Trade Marks Registration Act," which comes into operation on 1st January, 1876, and which compels the registering of all existing and future Trade Marks (or the rights of their proprietors cannot be preserved against infringement), at a

Register Office to be established in London. Mr. Goulden, Offices for Registration of Trade Marks, 271, High Holborn, London, has forwarded us a synopsis of the Act, which it would be well for all interested to procure.

PHOTOGRAPHY IN WINTER.—The season is approaching when some may be troubled with a want of sensitiveness in their bath or collodion, as they suppose, which they may find it difficult to account for. To such I would say, look to the temperature of your dark-room. When you find the atmosphere becoming chilly to yourself, you need not be surprised if your chemicals begin to work slow. The best remedy is to keep your apartments warm, so that they shall not be below 70°. If this cannot be done conveniently, it may be sufficient to warm the developer; or the plate, just before development, may be slightly warmed by laying it a few moments on a heated soap-stone, which may be kept at a proper temperature by placing it on a couple of brackets over a gasburner or lamp. Or, it is often sufficient to draw the bath off in the morning, and warm it well before commencing the day's work; this removes the chill it receives during the night, and it will continue to work well throughout the day. A warm bath and warm developer are always favourable to rapidity.—R. J. CHUTE, in *Times*.

DEATH OF SIR CHARLES WHEATSTONE.—We regret to announce the death of Sir Charles Wheatstone, which took place in Paris on Tuesday. Sir Charles, who was the scientific inventor of the electric telegraph, and professor of experimental philosophy in King's College, was born at Gloucester in 1802. His claims in connection with the invention of the stereoscope are well-known to photographers. At the Photographic Exhibition of 1873 he exhibited a photographic application of the "Wheel of Life." For many years he was a member of the council of the Photographic Society. Nearly forty years ago he devoted his attention to the adaptation of electricity to a practical system of telegraphing, and with the realization of that object his name will be inseparably associated. In 1868 he received the honour of knighthood, and in the following year was awarded the distinction of LL.D. from the University of Edinburgh.

A WOODEN DIPPER.—At the last Convention of the N. P. A. of America, Mr. Lee Knight described his wooden dipper as follows:—"I make it out of one solid piece of well-seasoned hickory. If the bottom of the bath be constructed a little too thin the dipper will not go down. I had one, and I sharpened the end so that it would go down. I found that by making it in that way, an inch and a half longer, it would go down in the bath, and there was no difficulty arising from the stirring up of any particles of film that might be in the bath. We all know that in case of a large bath it is troublesome to be always filtering it. There are some little points of collodion that drop down and settle on the bottom of the bath, and if you are not careful in the immersion you start a current that raises these particles. By having a dipper shaped in that way, it goes down without creating a current, or the slightest approach to a current; that is taken away from the plate, so that no particles shall be deposited on the plate. The others are particles in suspension, and the trouble is avoided by having this shape of blade. The apparatus is simple and complete. It is merely a blade of well-seasoned hickory, without any other preparation whatever. It can be made by any one, and does not cost anything scarcely; don't get out of order. Having it pretty wide at this point the capillary attraction will hold the plate securely without the necessity of any springs or slats, or anything to hold the plate. Nothing more than the capillary attraction is necessary. That is, in my experience, sufficient. Occasionally I used to lose a plate in my bath. That is not possible with this dipper. This is not injured by being left in the bath. I have had some dippers said to be absolutely proof against the action of any of the photographic chemicals, but by leaving them in the bath two or three days the silver would be precipitated in very fine sponges from the points where the screws were. This, you will observe, is just shaped from one single piece of wood."

To Correspondents.

A. A.—As the first three years of the patent have expired, we do not think it likely that the patent was renewed, which would have involved the further payment to the Patent Office of £50. We are not absolutely certain, but we have no doubt that the process is now free to every one.

NAILOR.—The address is Mr. E. G. Wood, Cheapside, London. You will doubtless be able to obtain condensers from him; but we cannot tell you what they will cost. You will be able to obtain from the firm who supplied you with carbon tissue the Manual containing full instructions for working it; or, if you state what steps you take, and at what points you find special difficulties, we shall have pleasure in giving you instruction as to the best method of overcoming the difficulties.

JOHN TERRAS.—We are obliged by your suggestion, and will consider it. The gentleman you name is chiefly distinguished for large work, and has no especial pre-eminence in cabinets. We doubt much whether the mass of readers would be willing to pay an increased price.

LYONS SUBSCRIBER.—There are various modes of producing blue prints. Here is one which was much used for copying purposes, such as you describe, by Sir John Herschel, the discoverer of the cyanotype processes. Take of ammonio-citrate of iron 120 grains, and of ferridcyanide of potassium (red prussiate of potash) 140 grains, and dissolve in two ounces of water, and keep the solution in the dark. Apply with a Blanchard brush to the paper, and allow to dry in the dark. Expose under the subject, and then wash in clean water, which develops and fixes the picture at the same time. 2. One cause of the defect you name is the emulsion of the tissue. If it have been kept sensitive too long, especially if the weather be damp, the tissue becomes more slowly soluble, and manifests the defect in question.

REFLECTION.—That which you call reflection on the background is really what is termed a "cast shadow," that is, it is a definite shadow cast by the object upon which the light falls. In the group you have sent you will find the shadow of the girl on the background, and the shadows of the feet of the boy on the carpet. They are doubtless due to the strong reflected light from the white wall on which the sunshine falls. Such a cast shadow is in fact, however, no defect, but gives an effect of solidity and relief to the figures. The sitters are not well lighted, however; there is too much generally diffused light, and a lack of concentrated light on the figures. The images are also very imperfectly defined, either from being badly focussed, or from the lens being a bad one.

SOUTHERN HEMISPHERE.—Of course general rules are laid down as to the position of the glass house for the majority of the readers addressed, and these are residents in this part of the world. Those who reside in far different latitudes must inevitably make such modification as their position demands. In every such case the photographer himself must determine the modification required in his special case. The article to which you refer was quoted from an American journal, and we gave it precisely as it stood. The statement of the case was no doubt true; but a somewhat exaggerated estimate of the facts was given.

F. S. C.—For copying maps and printed matter an old ripe sample of collodion is most suitable, and a weak iron developer; say eight grains of iron and twenty minims of acetic acid to an ounce of water. If the collodion be not old, add a few drops of tincture of iodine to each ounce of the collodion, until it is of a sherry colour. In copying oil paintings somewhat different conditions are needed. The collodion should contain a good proportion of bromide; say not less than two grains to each ounce. The exposure must always be a full one, and if the picture can be placed in a good light in the open air it will be best. A fifteen-grain iron solution with fifteen minims of acetic acid will serve.

HENRY DUNNING.—With such a studio as you intend building, about six feet opaque at each end of north side and roof, and the remainder glass, will answer. Each end will, of course, be opaque; and the greater portion of south side and roof. A few feet of light in south side, or roof, or both, to be kept usually covered, might be found of occasional value to uncover, for special effects of lighting. The pitch of roof should not be less than 45°, and somewhat steeper if you like. There are certain advantages in having the ridge out of the centre, giving the largest half to the north. If you place the ridge so as to give six feet at the north side, and four at the other, having the ridge about thirteen feet high, and the eaves about six feet high, you would secure a noble expanse of north top and side light joined. The raised platform is altogether unnecessary, and even troublesome. 2. Our publishers, doubtless, can supply the journal in question. We will pass on your request to them.

B. L. F.—The sample of carbon tissue you enclose is quite insoluble, as you state. If it were so, as you describe, as soon as it was dry, it must have been many hours drying, which, if being in a damp place, during the present weather, might easily happen. Do not soak the tissue too much in sensitizing; and hang in a warm dark place to dry, if possible, with a current of air. In slow drying the tissue often becomes insoluble.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR SEPTEMBER.

BY WILLIAM HENRY WATSON.

Observations taken at *Braystones*, near *Whitehaven*, 36 feet above sea level.

Date.	THERMOMETER.			BAROMETER.			Direction of Wind at 9 a.m.	REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1	61°	63°	60°	29.15	29.15	29.20	S.	Rain a.m.
2	60	63	60	29.20	29.17	29.10	S.	Rain p.m.
3	59	60	56	29.20	29.50	29.71	S.W.	Showers a.m.
4	52	57	57	29.76	29.80	29.78	W.	Fair, generally gloomy.
5	57	61	58	29.70	29.61	29.70	S.W.	Rain a.m. and p.m.
6	58	60	57	29.75	29.58	29.90	N.W.	Fair, generally sunny.
7	54	59	56	—	—	—	S.W.	A little rain this morning.
8	56	58	55	—	—	29.76	S.	Fair and sunny.
9	56	57	56	29.76	29.80	29.85	S.W.	Fair, but gloomy.
10	56	62	57	29.88	29.90	29.87	S.W.	Fair and sunny.
11	53	57	50	29.80	29.76	29.76	S.	A little rain a.m. and p.m.
12	50	56	50	29.75	29.73	29.70	S.	Rain a.m.
13	57	59	57	29.74	29.80	29.91	S.W.	Fair and sunny.
14	57	61	54	29.96	29.99	30.00	S.S.W.	Rain p.m.
15	63	63	53	30.18	30.15	30.12	S.S.W.	Fair and sunny, generally.
16	55	61	56	30.07	30.03	30.00	W.S.W.	Fair and sunny.
17	58	69	55	29.95	29.94	29.95	W.	Fair, but gloomy. Lightning a night.
18	60	70	61	29.97	30.00	29.98	W.	A little rain this evening. Distant thunder during the day.
19	68.5	73	68	29.90	29.85	29.82	S.	Fair, but gloomy. Very sultry.
20	60	64	61	29.79	29.80	29.77	S.S.E.	Heavy thunder, with lightning and rain, about 1 o'clock this morning. Gloomy all day.
21	61	64	60	29.73	29.70	29.67	S.	Fair, generally sunny.
22	58	—	—	29.60	—	—	S.W.	Fair, generally gloomy.
23	51	56	54	30.00	29.99	29.94	S.W.	Rain at night. Windy.
24	52	56	54	29.86	29.82	29.72	S.	Very strong wind, with rain showers, a.m. and p.m.
25	58	—	56	29.60	—	29.72	S.	Rain this morning. Windy.
26	60	61	60	29.44	29.40	29.15	S.	Very strong wind with rain all day.
27	58	60	56	29.20	29.40	29.45	S.	Strong wind, with showers, a.m. and p.m.
28	54	60	54	29.41	29.41	29.49	N.W.	Strong wind, with occasional showers, a.m. and p.m.
29	53	59	53	29.50	29.58	29.70	N.	Very strong wind at night. Showers a.m. and p.m.
30	56	61	55	29.80	29.82	29.78	S.W.	Fair, generally sunny.

Summary.				Mornings.	Noons.	Nights.
Maximum temperature observed	...	...	...	68.5°	78°	68°
Minimum ditto	...	...	...	50	56	50
Mean ditto	...	...	...	57	61	56.4

Mean of whole	...	...	...	58.12+	...	...
Number of days on which rain fell	...	...	...	...	...	17
Number of fair days	...	...	...	...	...	13
Fair days, sunny	...	...	...	...	...	8
Fair days, gloomy	...	...	...	...	...	5

NOTES.—From a comparison of the results of my observations during September 1874 (*Photographic News*, Vol. xvii. p. 516), and then in the corresponding month this year, as above, it will be seen that the mean temperature of the latter has been a *little* higher than that of the former. The past month has been very variable in its aspects, and we have had brief samples of both summer and winter. Up to the 19th we experienced delightful summer weather, when the atmosphere became very close and sultry, and early on Monday morning, the 20th, there was a somewhat heavy thunder storm, the thunder being loud, and apparently nigh at hand, while the lightning was vivid and almost constant. The rain was unusually heavy for two or three hours, in several localities flooding houses, &c., where due access was not given for its escape. The gales, which we expect at this season, were of extreme violence, several trees being uprooted, and a few recently erected stacks of corn turned over. Happily, the fierceness of these gales had been correctly predicted, and those who have faith in meteorological prognostications were prepared for any casualties which might occur. It often happens that after rough equinoctial gales we have fine bright weather in October, which will doubtless be fully appreciated by both the agriculturalist and photographer; as yet, however, the weather has been anything but in accordance with that view. The turnip crops of the present year in this neighbourhood have been very successful, and remain, up to the present time, perfectly sound. Our reports as to the grain crops remain also satisfactory, so that it would seem that the present year may be looked back upon as a model one for the cultivators of the soil—at least so in West Cumberland.

Braystones, nr. Whitehaven, October 5th.

PHOTOGRAPHS REGISTERED.

- Mr. WHEELER, Brighton,
Two Photographs of Mr. John Hodgkin.
CAPTAIN ARNET, Rochester,
Thirty Photographs, Views and Scenes in Egypt.
Mr. A. FROLEN, Southampton,
Two Photographs of the late A. G. Stevens.
Mr. THOS. HART, Birmingham,
Three Photographs of Mr. Charles Lewis.
Mr. J. T. CASE, St. Ives,
Photograph of an Old House in St. Ives.
Mr. J. CARDEA, Brompton,
Four Views of "Earl's Court House."

The Photographic News, October 29, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE DEATH OF SIR CHARLES WHEATSTONE.—SMALL PORTRAITS IN CARBON.

The Death of Sir Charles Wheatstone.—In the death of Sir Charles Wheatstone photographers have lost an earnest sympathiser and well-wisher, those who knew him of late years being well aware that his interest in matters photographic increased rather than diminished as time went on. It was no little honour for the Photographic Society of London to have in its council the first practical electrician, the father of the telegraph, the inventor of the stereoscope, and the deviser of several other photographic novelties of interest, and it was with feelings of much concern that his friends beheld his name thrown out of that body when the first so-called "election" took place. A session, or exhibition, never elapsed without Sir Charles taking some part in the affairs of the Society, and these claims seem afterwards to have been recognized, for the name of Wheatstone shortly afterwards made its appearance on the council roll again, he being, we believe, the very last of the twenty-four gentlemen elected. Very few must have been aware of the lively interest Wheatstone really took in photography and the practical applications of it. He was always working away at his beloved stereoscope, or some modification of it; for he it known that, although Sir David Brewster was the first to construct a stereoscope with lenses, it was undoubtedly Wheatstone who first made any instrument at all of the kind. Wheatstone obtained the optical effect desired, not, however, by means of two lenses, but with a couple of mirrors placed at a certain angle; and although the instrument was scarcely so simple and compact as that afterwards constructed by Brewster, the Wheatstone apparatus permitted the employment of much larger pictures—some ten or twelve inches in length. For this reason alone it is a pity, we think, that so very few instruments are made upon the Wheatstone pattern, which, on the whole, is more convenient to view than the ordinary one. We have said that Sir Charles took a lively interest in the affairs of the London Photographic Society when a member of its council, and although he attended personally but two or three times in the year, still his advice and assistance on these occasions might be deemed fully equivalent to the services afforded by less illustrious councilmen. On the occasion of the visit of H.R.H. the Prince of Wales to the exhibition a little while ago, Sir Charles took an active part in the arrangements, and collected together many objects of an interesting nature to give the Society every éclat possible. It was then that he exhibited once again his original stereoscope, together with another clever little instrument, a photographic—or, rather, stereoscopic—adaptation of the "wheel of life." This novelty had occupied his attention for some time, and, with the assistance of Mr. Baden Pritchard, of the Royal Arsenal, who provided suitable photographs for the instrument, Sir Charles was enabled to depict a steam engine at work, by the aid of photography. To do this thirteen photographs had to be taken of the same engine, from precisely the same point of view, the engine wheel being turned one-thirteenth of a circle after each successive picture was secured, the piston and other parts being thus made to change their position also in every picture. These pictures, put into a stereoscope and made to revolve before the eyes by an intermittent action, gave the idea of the machine being in motion. Some pictures of soldiers going through their evolutions with the rifle were also taken at Woolwich for a similar purpose; but Sir Charles' death has now, unfortunately, brought the matter to a standstill. Another subject which of late attracted Wheatstone's attention was balloon photography, and on several occasions we have had the pleasure of discussing the matter

with him. Some pictures which Nadar, the great Paris photographer and aeronaut, secured a year or two back, he was good enough to show us, and he promised to use his endeavours to get Nadar to publish his mode of procedure, which that gentleman did, in some measure, in our columns, through the medium of M. Ernest Lacan. Sir Charles was often a visitor at Nadar's in Paris, as also at many of the clever opticians of that city, in whose experiments he continually interested himself. As a proof, indeed, of his keeping abreast of the times, we may mention that the last time we visited him at Park Crescent, two years ago, he was studying Ducos du Hauron's pamphlet on photochromy, and called our attention to several shortcomings which had still to be surmounted. But he was very enthusiastic in the matter of doing something in this direction, and we saw in his hands a photograph in colours (possibly one of M. Leon Vidal's) which he had dissected for purposes of examination. But photography, although it occupied much of Sir Charles Wheatstone's attention, was, as we know, only one of the many applied sciences with which he busied himself. His name will be longest remembered as having, in conjunction with Fothergill Cooke, introduced practical telegraphy by means of electricity. It was for this public service that he received the honour of knighthood in 1868, the supplement to a substantial reward which his valuable telegraph patents must have brought him. One of the most successful of his inventions after the first practical introduction of electric telegraphy was his A B C instrument, in which he dispensed altogether with the cumbersome and troublesome galvanic battery, employing a magneto-electric machine for the development of electricity. This A B C, or dial instrument, is possibly the simplest telegraph apparatus yet devised, a needle pointing out each letter of the alphabet as it is telegraphed, so that any unskilled person may read or transmit a despatch. It is an instrument employed more than any other in places of business and in offices where no skilled electrician is to be found. In optics, in acoustics, and in every branch of physical science, Wheatstone was an adept, and when he was not engaged in working out some problem of applied science, he busied himself in elaborating little scientific toys and knickknacks, in the construction of which he was always happy. Many of the interesting playthings we have seen in Sir Charles Wheatstone's library would at once become popular were they brought before the public; and we trust that even these minor results of a great man's work will not be put on one side and forgotten. Sir Charles was for some time Professor of Experimental Sciences at King's College, and was a Fellow of the Royal Society of London and of the Académie Française of Paris. The first electric telegraph opened to the public, under the patent of Cooke and Wheatstone, was in 1838, on the Blackwall Railway, the same year that Wheatstone was received into the Royal Society.

Small Portraits in Carbon.—Those who are occupying themselves with portrait printing by the carbon process—and there are many, we believe, who are doing so at the present moment—may like to know of a plan which we saw practised a year or two back at the War Department Photographic Establishment at Woolwich. It is a very simple plan, and by its means carte-de-visite portraits were produced as bright and soft as by silver printing. An opal plate is coated with collodion containing a little castor oil, and the film, when dry, is covered with indiarubber solution, after which a narrow safe edge is made by rubbing a little varnish round the edges. Carbon prints developed on this support lose none of their delicacy, the faintest stain of pigment adhering to the glazed surface, and when transferred to a highly glazed paper they have all the appearance of an albumenized print. The coating of the plates is easily and rapidly done, and if a dozen are coated with collodion at one time, the first treated is ready to be treated in the same way with the rubber

solution as soon as the twelfth has been covered with collodion. The making of the safe edge afterwards is managed with a paint brush, and as all the solvents employed—ether, benzole, and spirit—rapidly evaporate, a quarter of an hour suffices, in a dry warm room, to get the plates ready. A preliminary coating of the plate with paraffin dissolved in alcohol can be used to facilitate the final separation of the image from the glass. The rubber may sometimes be dispensed with, but not the safe edge of varnish; and if the latter is applied all over the collodion surface, a stippled, yet glazed image, is produced.

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XXII—(continued).

TRANSPARENT POSITIVES.

TRANSPARENT positives can be made (1) by the copying camera, (2) by printing on dry plates, and (3) by the collodio-chloride process; but as, by the second and third processes, we are restricted to reproductions of the same size, the first proves most useful, enlargement and reduction being possible.

To make transparent positives in the camera.—Our first requirement is a camera which will give great length for focussing. I have used an arrangement that will, I think, commend itself to all as simple and efficacious:—A long tunnel box, blackened inside, and fitted with grooves for the reception of the camera. At one end the camera is inserted in the grooves, and across the other end of the box a board with an opening for the negative is fixed. The focus can be adjusted, first, by the movement of the camera in the box towards or from the negative from which the positive is to be made; and secondly, and with proper exactness, by means of the focussing arrangement of the camera inside the box.

This box can be adjusted to any angle at an open window, by means of movable legs fitted underneath the box, and will rest on a table or camera stand.

The negatives from which it is intended to make transparent positives should be specially prepared for that object, thin, full of detail, very sharp, and without trace of fog, and should not be varnished.

The exposure of the transparency should be double the time ordinarily given, and the developer made up with an excess of acetic acid. Fix with cyanide.

THE REDUCTION OF GOLD AND SILVER RESIDUES.

The recovery of gold from the toning bath waste.—The water having been drawn off from the solution dry the purplish black deposit (which consists of metallic gold and iron), and expose it in an iron vessel to a bright red heat, whereby the iron of the deposit is changed to the sesquioxide. When cold the powder will appear dark red. This is placed in an evaporating dish, and hydrochloric acid is added. Care must be taken that the acid contains no free chlorine, to test which, place in it a piece of pure leaf gold, which should be unaffected. If it dissolves, the acid must not be used for our purpose.

The mixture is now gently heated, being stirred the while. The iron will immediately commence to dissolve, and when the seething has ceased, dilute the mixture with water, and filter. Wash the remaining black powder in ten or twelve changes of water, and the result is pure metallic gold.

Reduction of chloride of silver.—The flux, a mixture of carbonate of potash 8 parts, and resin 1 part, is added to double its weight of the chloride of silver in the finely-powdered state, and packed into a Hessian crucible until it is about three parts full: upon the surface strew a thin layer of salt. The crucible is now put in a very hot furnace, and kept at a white heat for $\frac{1}{2}$ hr. The mass, which has frothed violently

calm. Allow the crucible to cool, when it may be broken, and the silver will be found at the bottom in a lump.

Reduction of paper wastes.—The flux, composed of carbonate of soda 12 parts, carbonate of soda 3 parts, and salt 1 part, is mixed with the ashes of the paper cuttings, and fused as described for chloride of silver. If the flux becomes stiff and thick during the operation, throw into the crucible a lump of nitrate of potash about the size of a marble. By so doing some of the impurities are burned out.

Reduction of sulphide of silver.—First "roast" in an open iron pan over a fire, until it reaches a red heat, and is fused into a smooth even mass; now mix 14 parts of the sulphide to 16 parts of a flux composed of carbonate of potash 8 parts, and carbonate of soda 2 parts. Half fill the crucible with the sulphide and flux finely powdered, and expose to a red heat.

The reduction of developer wastes.—The black mass is mixed with flux made as follows: carbonate of potash 5 parts, nitrate of potash 1 part; and treated as for sulphide.

THE PRACTICAL PRINTER IN AMERICA. XLIII.

THE PLATES.

It is sometimes a most difficult thing to obtain good plates, on account of the unevenness of the glass, it often being so wavy as to render it useless for good work.

Then, again, the plates sometimes have a rough surface, and are so frail that you are continually expecting them to break.

CLEANING OF THE PLATES.

There will be no difficulty at all in getting the plates thoroughly cleaned, if the advice is followed strictly out which has been previously given. (See porcelain plates.)

ALBUMENIZING.

The film peeling off during the subsequent operations of the plate after it is printed is due to the albumen solution being too thin, or the plate not being wholly covered by the albumen during the albumenizing. Roughen the edges of the plates, before albumenizing, by scraping them together, and flow with thick albumen.

Dirty plates are caused, either by using plates before they are thoroughly clean, or by dirt in the albumen solution caused by imperfect filtration, or by dust settling on them before they had dried, all of which will cause plates to be more or less dirty.

COLLODIO-CHLORIDE.

This is a very delicate collodion, and it should always be made and kept in the dark-room.

If the prints are blue and slaty in colour, and you are sure that it is not caused by overfuming, doubtless it is caused by the collodion, and in that case it is because there is not enough citric acid in the solution, for this is what gives the tone to the printing porcelain.

If the collodion prints flat, the chloride of silver in it is too weak, and you should make up another batch, containing a grain or so more of silver to each ounce of solution than what there may have been in the cast-away collodion.

Chloride of calcium in the proportion of 3.75 minims of the calcium solution is added to every grain of nitrate of silver there may have been placed in the collodion.

The beginner must remember that a minim is the same as an ordinary size drop, and in a solution of nitrate of silver 480 grains, and pure water 480 minims (one ounce), the silver is one grain strong to every minim of solution.

purpose of measuring out drops there is the
any graduate, which is graduated in one drachm.
as the scale marks are in minims, and thence, if
measure out 60 minims, and thence, if
on, all that

we would have to do is to fill the graduate up to the place marked 60 minims (which is one drachm), and besides being more sure in obtaining the exact quantity we wished, it is not near so tedious as it would be to drop the required number one by one from the bottle.

Suppose we were to make up a bottle of collodio-chloride which should just contain four ounces of plain collodion, and we were to add 32 drops of the silver solution named above. There would then be 32 grains of silver in the 4 ounces of plain collodion, which, by the way, is equal to 8 grains of nitrate of silver to each separate ounce of collodion. Now, when we are about to add the chloride of calcium solution to the rest of it, we should add 3.75 minims to every grain of silver there was added to the collodion, which, in this case, was 32 grains, and $3.75 \text{ minims} \times 32 \text{ grains} = 120 \text{ minims}$, which is one-quarter of an ounce.

As a rule, add of the citric acid in the same quantity as you do the chloride of calcium, and the proportion would then be the same, providing the solutions are each 32 grains to the ounce of 95 per cent. alcohol.

If you were to make up a batch of six ounces of collodion, and, as in the above case, you would wish to make it 8 grains strong of silver to the ounce of collodion, you would then fill up the tiny graduate to the place which should indicate 48 drops.

In adding the chloride of calcium and the citric acid to the collodion, you should add of both $3.75 \text{ minims} \times 48 \text{ grains}$, which is 180 minims.

The apprentice will readily see, by the perusal of the above, that he can make up a rule for the successful making of the collodio-chloride, providing, in the case of the chloride and the citric acid, he were to make up a stock solution of each of these in the proportion, as has been before said, of 32 grains to the ounce of alcohol.

Thick collodion is caused by having used plain collodion which contained too much cotton, or by having left for a time the bottle of collodio-chloride uncorked.

Dirty collodion is caused by not having the bottle clean in which it was made, and then, again, by the use of dirty solutions, which have been used in the making of it. The chloride of calcium solution, if made in a small quantity, cannot be decanted, and will often have to be filtered before use. The dirt in the collodio-chloride solution rises to the top, and by pouring off the top of it you can obtain clean collodion for use whenever you need it, although it had best be poured off immediately before you want it to use.

Yellow collodion is caused by age and heat, and occurs far more quickly during the heat of summer than what it does in the winter. This occurs more readily in collodion which is highly sensitized.

It would be a good plan to make up differently sensitized batches of collodion, each of which should be plainly labelled as to the exact number of grains there is to each ounce of solution at the time of making it, so that when you are about to print a harsh or a flat negative, you can flow your plate with that collodion which is best fit for that particular negative, and the results will be better.

FINAL WASHING.

Insufficient washing will cause the plate to turn yellow in a short time after it is dried, and the picture will gradually bleach and fade, and within a year's time the tone will be most disagreeable.

If the porcelain changes colour during this washing, then the collodion is too new, and sometimes the water is impure; and to determine as to whether the latter is the cause, use a little distilled water for the first washing.

FADING OF THE PORCELAINS.

This is in the majority of cases due to the porcelain plate itself, and is owing to the substance which is used in the bleaching of the colouring matter in the plate being left in the plate, and which thus affects the print, destroying it

in many cases as completely as it would be destroyed if the hypo was not well and thoroughly washed from it.

It is for this reason that some photographers will never make porcelains for their customers without first telling them that they will not warrant them to last longer than a given specified time.

There are good plates, however, as well as poor ones, and I have very often known porcelains to keep for two or three years in good condition, and look then as though they were good for full as many more.

The fading is not wholly in the plate, however, for it is often in the fixing and final washing of it that they sometimes fade on account of poor manipulation, besides various local causes which are impossible things to mention here, as there are different causes in every gallery. Always do your work as well as possible, and in ninety cases out of a hundred the porcelain will keep in excellent condition for many years.

GERMAN CORRESPONDENCE.

THE VIENNA EXHIBITION—THE BERLIN SOCIETY—PIGMENT PRINTING—LICHTDRUCK PROCESS—WOODBURYTYPE—AUSSELDRUCK.

BY DR. VOGEL.*

Whoever has crawled around in the thousands of corners of the Vienna Exhibition, with trouble and difficulty, to gather together everything appertaining to photography, and then, after much waste of time, overlooked many things, will fully know the significance of a photographic exhibition. The American project opens a new era for the arrangement of photography at international exhibitions. Further exhibitions will follow the example.

The Berlin Society for the Advancement of Photography has a collective exhibition in view, and applied for 100 square metres, equal to 1,000 square feet.

I do not know what applications have been received from England, France, and Belgium. It is, however, probable that the establishments in pigment printing will make a particularly grand display. In Vienna we had, besides Braun, in Dornach, several Belgian firms which distinguished themselves in this printing process. Lately, however, various photographic firms have given this process some attention. Spencer, Sawyer, and Co. have exhibited, at the late Brussels Exhibition, enlargements in pigment (carbon) of great brilliancy. I have heard that the above-mentioned firm intends the erection of a large establishment for pigment printing in Paris. The real Eldorado for pigment printing seems to be Brussels; there it has found such favour among the public that large demands are made for pictures by this process, and often is the question put to the photographer, "Do you make pigment prints?" and orders are withheld if the answer is in the negative. Not only dark pictures, but tinted portraits on porcelain glass, are made in pigment prints; and, in fact, the process is now so simple that every printer who has a little ingenuity can practise it. As I have heard that Spencer and Sawyer intend introducing the process into Berlin, I am anxious in regard to the success of the undertaking.

The Lichtdruck is now making just as sure progress here as the pigment print. Hitherto Munich was the emporium of it, and in the imperial city there was not a single "Lichtdrucker;" there are now, however, large establishments in Dresden, Hamburg, and on the Rhine. Now there are also two establishments in progress of starting here. What can be accomplished in this sphere in regard to elegance, my new portrait may show, which Obernetter publishes in the next number of my journal, which puts the finest silver prints in the shade. Obernetter has also excited great and universal admiration at the Geographical Congress in Paris with his "Lichtdruck Map." One of

* Condensed from the *Philadelphia Photographer*.

* The separate hall mentioned in a recent issue of the News is meant.

the most popular "Lichtdruckers" is Jacobi, in Neuendorf. He has simplified the process to such a degree that he offers to teach any silver printer to become a practical "Lichtdruck" printer.

The Woodburytype has not been found to spread much in Germany as yet. The firm of Bruckman has published large genre works in this; they are the only firm practising the Woodburytype in Germany.

A new printing process has very lately produced a very great sensation, and is called, after the inventor, Aubel-druck. It is executed by Aubel and Kaiser, Lindenhöhe, near Cologne on the Rhine, and has for its purpose the reproduction of drawings, engravings, and lithographs, in enlarged and diminished scale. One year ago I received from the firm a reproduction of an illustrated newspaper reduced one-tenth, showing all the woodcuts, the printing being distinct and legible. Lately, this establishment has furnished numerous reproductions of woodcuts. The prints are printed part in the lithographic and part in the type press, and it appears to be a fact that the great problem of the easy production of a type-plate by photography is solved. Aubel finishes not only finished prints, but also printing-plates on zinc or stone. I saw, lately, several of these plates on which Aubel, by his process, produced a print in fatty ink. This was then etched by the parties ordering it, and furnished a stone printing plate in lithographic manner, and a zinc plate, for type-press printing. Aubel and Kaiser have already large orders from illustrated newspapers.

ON ART IN PHOTOGRAPHY, AND THE LATE O. G. REJLANDER.

BY J. B. FORSTER.*

In the year 1865, soon after I commenced taking photographs, I met Mr. O. G. Rejlander, who was on a visit to Bowdon, and was introduced to him. I offered him the use of my gallery and dark-room, and a photograph I have brought with me will show you how to use the former. In that corner, which I covered for him in the way you see, he took as good pictures as any I have seen of his. He remained at Bowdon about a fortnight, and I had thus the coveted opportunity of becoming acquainted with him, and of seeing by what means he obtained the pictures which at that time had made his name well-known to lovers of photographic art.

No doubt some of those present will recollect some of his pictures at the Art Treasures' Exhibition. One of them—a large composition picture, called "The Two Ways of Life"—I present to your notice. It was, I think, taken at the suggestion of the late Prince Consort, who, at that time and until his decease, maintained friendly relations with Mr. Rejlander. The last portrait taken of the Prince was by Mr. Rejlander, prior to the development of the fever which ended his life. He left on Mr. Rejlander's mind a pleasant recollection. He always spoke of the Prince Consort with respect, and told many anecdotes of his photographic intercourse with him illustrative of his genuine princely character.

Mr. Rejlander was an artist before he became a photographer, and was both a painter and modeller. He had studied anatomy carefully, and was master of all it can tell, an artist of human form and action. He had also travelled in Spain and Italy, and had carefully educated himself from attentive study of the great masters, whose works are the classics of European art.

Not many years ago a very delicately painted child's head by Mr. Rejlander enjoyed a good place in one of the Royal Academy exhibitions, and bore comparison favourably with all that was best about it. A well-known artist assured me that Mr. Rejlander could never have been an

artist, or he would never have been a photographer; but artists as able to whom I have shown his pictures have recognized at once the true artist's work. How a man like Mr. Rejlander came to be a photographer I cannot say; for it was not only that he could paint well, that his eye felt intensely the influence of form and colour, but there were more than these qualifications for the artist in his nature. He had a keen sympathy with human life, and a genuine love of nature. No mood of either escaped his observation. He had himself felt the vicissitudes and the conflicts of life. He had tasted both its joys and its sorrows; but, though he had difficulty in earning his livelihood, yet he passed through life with his spirit unsoured, and nothing could destroy till the last the child-like simplicity of his spirit. He was young, even when disease had reduced him to a skeleton, and life was only suffering to the body. Wherever he was known he was loved, and whatever he took in hand he did well. His volunteer comrades raised him to authority in the ranks, and he won distinction amongst them as a marksman. His funeral was conducted with military honours.

The true artist, whether of the brush or pen, belongs to no sect or clique, and Mr. Rejlander belonged to none; you could not have enticed him into any wrangle or gossip, and his name never figured in any party strife. He felt those touches of nature which make "the whole world kin," because we are all human alike. He had the capacity and the heart to sympathise with all, and this, united to the power of making it vocal in pictures, or poetry, or prose, is one of the marks of genius.

Such, and much more, was the man I have undertaken to speak about to-night. I am only sorry I am not more competent to do justice to his memory; for here I must say that I am not an art-critic so much as one who has always felt the true and beautiful without analysis. I have the misfortune to be colour-blind—to wander in hopeless helplessness amongst reds and greens; yet, for all this, a picture which is not true in colour offends my eye, without my being able to say why it does so. I can more readily find out wherein drawing offends; but criticism, like everything else, is an acquirement only attained by study and analysis. I know I shall be sadly at fault in pointing out the excellences or defects of the pictures I have brought here to-night. They are not my selection, and I do not think they do full justice to Mr. Rejlander, as there are many I know of which are not here; but I have had to take what have been sent to me.

The first picture I will allude to is "Young Photography Hailing the Artist a Brush." Any photographer will at once wonder at the production of such a picture by means of the camera. No part of it is neglected. Hands, feet, form—every portion is studied with the greatest care and delicacy of feeling. It also expresses an idea of Mr. Rejlander's, for he felt how defective a photograph must be as a work of art when compared with the work of a painter or sculptor.

The hand of the artist holds many brushes; young photography—only a child, in fact—gives him one more. This idea is conveyed in a picture well calculated to show that as photography grows, the brush may be used with power. Paganini could play upon one string, but no man knew better than he the value of four; and so with any man who has tried to make a picture by means of the camera alone. If he has any sense of what a picture should be, he will feel, just as he is master of his one brush, the defects of his means for attaining the highest results. A great picture cannot be produced by the camera alone. Mr. Rejlander knew this very well, and with him the camera was but one brush, and a very inadequate one, for expressing what he wished to convey. But still, though it is not everything, photography has done good service to art, and it has effected much in the way of artistic education.

* Read before the Edinburgh Photographic Society.

power as the can

nd from the first

to be used, and its productions to become familiar to us all. That they should be good, therefore, was always of the first importance; and if all artistic feeling had been withdrawn from it, and all artists had despised it, the world would have been poorer than it is. It has made us all familiar with countries and with life we could not otherwise have known so well as we do. 'The lineaments of great men are known to us all as the faces of friends, and its truthful delineations of the features of those who are dear to us, and of many whom we shall never see again, have made the discovery of photography one of the great blessings of modern times.

No doubt it was in some respects a pity that a genius like Rejlander should have devoted himself to photography almost exclusively; but the new art needed such devotion, and it would be ungenerous not to recognize the service rendered to it by the man whose love of art induced him to dedicate his life, not to making money by it, but to showing how it could be raised to a worthy place, made to awaken sympathy with beauty or with suffering, and to serve as an educator of national taste.

Mr. Rejlander took a portrait of me, and coloured it on the albumenized surface of the paper. I have no other specimen of his work in colour to show, but have brought this, as it gives some notion of his work as a painter. Mr. Rejlander was, I believe, the first to produce in a photograph those effects of light which are now so common in what are called "Rembrandt" photographs, some of which are so devoid of natural beauty, and are mere tricks of lighting or retouching. He never "rode a hobby to death," and in all his pictures where this effect has been produced, you will notice that he is careful "not to overstep the modesty of nature." I have seen a great many of Mr. Rejlander's photographs, but I never, save in one instance, saw a picture repeated. However successful he might be, he seemed to possess such endless fertility of resource that he did not feel the need of repeating it again. He had no *repertoire*; nature afforded him variety. This was the result of an eye that saw beauty everywhere and in all manner of places. This quality in Rejlander was another mark of his genius.

In painting or in sculpture the artist can produce a perfect result. Sculptors and painters present us with forms more perfect and beautiful than any which exist in nature. Every part of a figure can be made perfect by study and care; but this is not so with photography, which can only be made to yield the best of that which is. A photograph, therefore, must be criticised under different canons to those by which we judge of a painting. It is seldom, if ever, that a photograph can be perfect, and the more the parts it has, the less is it possible that it should be so. It is more likely to be perfect just in proportion to the simple character of the subject. A face may be beautiful, but is seldom perfect; but an eye, a forehead, a nose, or an ear alone may often be faultless in form, and so throughout the figure. When we come, however, to grouping more figures than one or two, or deal with the nude form in photography, the chances of failure are very much increased. In "The Two Ways of Life," Mr. Rejlander attempted far too much, and as a picture it is full of the gravest defects. It is not within the province of photography to realize such a conception.

Still, in most of Mr. Rejlander's pictures it is remarkable how many perfect parts there are in each. Sometimes he would keep a photograph in almost all respects bad for some one excellence. A photographer can hide defects by careful posing, and of one face make many different pictures. Note "The Sweep's Wife," and a large sleeping head. Both are from the same model, and the tall form in one called "Hope" is also from the same. Observe not only the whole picture, but also the parts, for Mr. Rejlander saw all. You will generally be able to discover what is good in something that, as a whole, does not please. Many photographs please as a whole, but will not bear

analysis—more especially photographs of figures. But what beautifully drawn hands and feet you may meet with constantly in Mr. Rejlander's photographs! Mr. Rejlander was full of humour. "Mother Goose"—"Remarkable! I Have Lost My Pen, and Now My Spectacles are gone!"—"She's Looking at Me, the Dear Creature!" are perfect in their way. The last is a wonderful picture, as is also "The Winking Virgin," &c. In his pictures of London street boys we have both humour and pathos combined. In them the photographer claims kindly sympathy for the victims of misfortune and neglect. Notice "A Street Arab." Why photograph those features and rage? Not certainly because they are beautiful. "Adding Insult to Injury," and "Jim, is it a Good Un?" are full of life. "The Song Without a Shirt," and "Homeless," are inexpressibly sad. All these pictures appeal to us to pity and help, and not to pass by on the other side. I do not know of anything in photography that approaches so nearly to what we call a picture as some of these photographs. I know of cleaner and sharper photographs, and more momentarily striking, but of none which will bear thinking of so well from many points of view.

To produce pictures by means of photography is a slow process. A slow process means expenditure of time, and, in England, time is money. Mr. Rejlander knew how to take a sharp and clean photograph as well as any one; and I have heard him say that he knew what would pay best, but that he could not do it, as he felt it would be degradation and a dereliction of duty to pander to what he thought to be untrue. So he preferred being poor, if that must be the penalty for being true to art. He therefore did not try to turn out the greatest number of pictures, so as to get in return the most money; but would study his subjects with care, and work at them for hours in order to produce the best he could. His plates would get dry and spoiled just as what he wanted was found, and then he dare not miss seizing the fleeting form on anything he had by him; hence, defective negatives only too often, from a purely photographic point of view.

Some may think that in all this Mr. Rejlander was Quixotish, but we may very safely say that had he not been so, though his pocket would have been enriched, it would have been worse for art and for us. Men who take Mr. Rejlander's view of duty in life are not plentiful, but they are the great ones of the earth, however lowly may be the vocation in which they work.

A long and painful illness confined Mr. Rejlander to his room almost entirely for many months before he died. He literally starved to death.* He could not earn money, and the expenses of his illness were such that he wrote me saying how slowly he was dying, and how expensive it was to die. Considering this, Mr. Rejlander did not die owing much—not as much as he must have lost during this distressing period. When he died, his widow was left unprovided for, and a fund has been started by some of his friends in London in order to assist her to begin and work for herself.

My duty is done now that I have told you what I know to have been true of a brother of our art—of one whose genius and excellence shed some lustre on the profession. If, out of love for what was worthy and great, and gratitude for a well-spent life, any of you incline to send something to the fund for helping Mrs. Rejlander, you will do that which would have pleased him most, and what he would bless you for could he know of and acknowledge his gratitude for your approval.

* Sympathising, as we do deeply, with Mr. Foster's paper and its aim, we feel bound, nevertheless, in the name of many of Mr. Rejlander's friends in London, to take exception to this sentence. Mr. Rejlander died of a painful illness, in which such food as a failing appetite could take afforded but little nutrition, and hence he wasted to a mere skeleton. But he did not die of starvation. Whilst he could not earn money for some months, and doubtless felt some of the privations inevitable to a sensitive mind under such conditions, yet he was not forgotten by friends, of many of whom we were the personal agent in aiding him. We saw him on his death-bed, and some of his last remarks were expressive of deep gratitude for the kindness of friends.—Ed.]

The Photographic News.

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THE TECHNICAL EXHIBITION OF THE SOUTH LONDON SOCIETY.

THE technical exhibition held by the South London Society has become an annual institution eagerly anticipated by many. The idea of such an exhibition was a very happy one, and the credit is due to Mr. William Brooks. Example or practical demonstration must always possess advantages over every other form of teaching. Novelties of any kind, whether apparatus or process, are best understood when seen. The working of some handy contrivance may be shown and explained in five minutes more satisfactorily than it could be in an hour's verbal description. And at this annual technical exhibition photographers generally are invited to bring forward novelties of every kind, from the simplest contrivance to the most elaborate pieces of apparatus; from the most trivial modification in manipulation to the most important process. Not merely novelties are welcome, but any practical demonstration which can make more clear and interesting processes and things already known. Neither contributions to the exhibition nor attendance at the meeting is confined to members of the Society. All photographers, metropolitan and provincial, are invited to contribute: all are invited to attend.

At the commencement of this annual technical meeting two difficulties presented themselves, and threatened to destroy the project: one was a tendency on the part of some to bring forward secret processes, or patented articles, availing themselves of the meeting as a good opportunity of advertisement; the other was a tendency to run into lengthy discussions, which ran away with time, and did not permit opportunity for giving due attention to important matters still to be brought forward. By the adoption of a few prudent regulations these difficulties and their consequences have been averted. Everything novel or interesting in the way of process or appliance is permitted to be introduced, because a knowledge of the existence of such things, and a sight of some of them, may be useful to photographers; but secrets or patents belonging essentially to commerce can only be briefly introduced, and not discussed. Discussions, indeed, on any subject, are not permitted. The great aim of this one meeting in the year is to be practical, and to avoid running into talk. Brief written papers describing a process or thing are invited, and questions which may elicit fuller information on any obscure point are permitted; but expression of opinion, or discussion of any kind which might either waste time or discourage the free contribution of practical matters, by the most retiring of photographers, is prohibited. It will be seen that such a meeting must be

interesting, and free from any of the disturbing elements which slightly jarred at the first meeting of the kind held.

RULES OF THE TECHNICAL EXHIBITION.

To secure a satisfactory issue, the following rules have been drawn up by the Sub-committee:—

1. That papers be allowed to be read (which must be as short as possible, and as much to the purpose as can be written). Such papers to be sent to the Hon. Sec. on or before November 10th.
2. That opportunity be granted for practically working a process or making an experiment, consistently with the time at the disposal of the Committee.
3. That secret processes or patented articles, with the names of inventors and their objects, be only briefly stated by the Hon. Sec., or by a member of Committee.
4. That explanations be allowed, but only absolutely in reference to the practical uses of the articles shown.
5. That questions may be asked of exhibitors referring only to a clearer understanding of the subject, but that no discussion be allowed respecting objections or differences of opinion on any matter.
6. That all packages be delivered (free of charge) by five o'clock on the evening of meeting.

THE PHOTOGRAPHIC EXHIBITION.

LANDSCAPES AND REPRODUCTIONS.

THE hanging of the pictures in the present Exhibition is, for the most part, judiciously managed; but it is inevitable, perhaps, that some frames must be hung too high, and some too low, for satisfactory examination. In the Exhibition now open in Pall Mall, it is a misfortune that some good pictures are so placed, and some to which, had not the exigencies of space, size, and other conditions interfered, we presume the hanging committee would have preferred to give a place of more honour and prominence; *Mons. Davanne's* "Bridge of St. Louis, Menton," we may mention as a special instance. Several of those we now proceed to notice are in positions not favourable to examination.

Amongst the elevated pictures is No. 1 in the catalogue, entitled "The Nest," by Mr. B. Wyles. Whether it is a direct picture or an enlargement, and whether a composition or a bit of nature—selected, not arranged—we cannot tell; but it is very charming in general pictorial effect. "Thawing," by Mr. F. M. Sutcliffe, a clever winter scene, is in a similar position. Captain Turton's pictures 74 and 75, being hung somewhat low, are apt to miss the attention they deserve; a view on the Ouse is especially good, the group of figures being most artistically and effectively placed. Four twelve by ten studies of ferns, or masses of growing ferns, by Mr. E. Fox, are very fine; and a frame of various subjects, of which we like "Sand Carts" the best (55), by the same artist, is also good. Mr. T. S. Catford sends a frame of views in Devonshire, with some excellent qualities, a "Rough Sea" being most effective. Mr. W. Collie's frame of Hot Springs in New Zealand are good as pictures, as well as interesting from the subjects. Mr. G. Mansfield has several good landscapes, but they lose something of their legitimate effect, and look cold and naked, from the broad margin of cold, grey board on which they are mounted. A finishing line round the prints, or a mount placed over, with bevelled edge, even if the same colour had been used, would have improved the effect. The Rev. W. A. C. Atkins, a new contributor, sends several landscapes to the present Exhibition, all distinguished by peculiar delicacy and artistic feeling. Mr. G. F. Dew sends several landscapes, of which we like the "Old Ruined Bridge" and "Plane Trees" (222-3) best; some of the others have a slight tendency to blackness. Some studies of trees at Tottenham, by Mr. J. W. King, are effective photographs of foliage, but a little too heavy, chiefly from deep printing. Landscapes

by Mr. A. Ford Smith are distinguished by artistic feeling. Mr. F. T. Palmer sends some charming little pictures, of which 331, a "Hedge Sparrow's Nest," pleases us best. A variety of studies by Mr. J. C. Stenning contain some pleasing pictures. Mr. Law's views of Dodford display great care, and are interesting. Messrs. J. Burton and Sons send several frames of Warwickshire subjects, of which the views of Stratford-upon-Avon Church are best. Mr. J. W. Lumley, Mr. H. Mousfield, and others also send some landscapes with good qualities. Mr. Woodbury sends a portfolio of very charming little landscapes produced upon plates prepared with the emulsion of the Liverpool Dry Plate Company; and other portfolios contain some capital Californian landscapes on a large scale by Mr. Watkins, and very excellent and interesting Chinese subjects by Mr. D. K. Griffiths, late of Shanghai.

The present exhibition is not rich in reproductions, but there are some very good examples. Mr. H. Dixon sends some very good copies of water-colour drawings. A marine portrait of the *Fanquard* is not the ironclad which now lies deep in Dublin waters, but a ship of war of nearly three hundred years ago, dated 1588. The same photographer's fine print of the *Galatea* is a portrait of the present well-known ship of the Duke of Edinburgh, and these, and some other copies of pictures by the same artist, are very excellent work. Mr. England sends some very admirable reproductions from painting and sculpture; the excellence of his work causes regret that the paintings copied are in many cases so poor. Mr. Hollyer is fortunate in the class of work which falls to his hands for reproduction; and whilst many of the subjects tax all the photographer's skill to do them justice, they are worthy of the effort; 194, a copy of a figure by—if our memory of the painting serves us aright—Mr. Albert Moore, is an admirable example. Another example from a modern painting is an excellent copy of a picture, by Millais, sent in by the Fine Art Publishing Company, entitled "Stitch, Stitch, Stitch," illustrating Hood's Song of the Shirt. Some examples of the photography of gold and other lace, by Mr. W. Bates, are very interesting. Some reproductions for book illustrations, by the Woodburytype process, are excellent, and there is nothing finer of the kind exhibited than a heliotype reproduction of a print, entitled "The Bazaar," sent in by the Royal Engineers from Chatham.

A volume on the table, entitled "The Royal Academy Album," is a very good example of work, for which photography should be especially valuable, and has on the Continent already proved so; but in this country it has hitherto lagged strangely. This album contains a large selection of copies of the pictures exhibited at the recent exhibition of the Royal Academy. If the interests of painters, buyers, and art publishers could be brought into due harmony, such a volume, issued as early as possible after the opening of each year's Academy, as we have before intimated, would prove most valuable and interesting, a boon to the public, and an important source of profit to the painter, or owner of the copyright.

MR. ALDERMAN NOTTAGE.

ALTHOUGH photography is but six-and-thirty years old as an art, and still younger as a field of industrial enterprise, it is old enough to have permitted some fortunes and many reputations to have been made in its practice in both relations. In illustration, it will interest photographers to know that a gentleman well known in connection with their art has just achieved a civic honour which is generally a step to the first position in the first city in the world. Mr. G. Swan Nottage, of the Stereoscopic Company, has, in a warmly-contested election, been made an Alderman of the Ward of Cordwainer, by which he is called to the important position of a magistrate of the city of London. Mr. Nottage's competitor was Sir John

Bennett, a recent sheriff of London, and a gentleman of indefatigable energy and considerable influence and popularity—circumstances which give the greater value to Mr. Nottage's success. The *City Press* gives the following biographical details in relation to the new alderman, which will interest our readers:—

The new alderman is descended from the family of the Nottages, of Nottage, in Glamorganshire, who afterwards settled in Essex, in which county he spent his early youth. He was born within sound of Bow Bells. He is fifty years of age, and was married in 1851 to Christiana, daughter of Mr. James Warner, belonging to an old Cheshire family. His residence is at Tulse-hill, and his family consists of a son and daughter. He was afterwards for many years engaged in the large iron business of Mr. Robert William Kennard, the late member for Newport. Mr. Nottage is a nephew of the late Mr. Alderman Challis, who for many years represented the Borough of Finsbury in Parliament; and, strange to say, Mr. Kennard and Mr. Alderman Challis served the office of Sheriff of London and Middlesex during the same year. The Alderman-Elect was, a few years since, a candidate for a seat at the Board of the Union Bank of London, which he lost only by a few votes, gaining, however, a moral victory by securing the support of a majority of 109 of the proprietors. Mr. Nottage having from his earliest years evinced a great taste for the fine arts, and the stereoscope having then been invented, he saw that this instrument in connexion with the undeveloped art of photography, if brought out on commercial principles, a large and lucrative business might be established, and he at once threw the whole of his energies into the new enterprise, under the title of the London Stereoscopic Company, which has since developed into the largest concern of the kind in the world. Sir David Brewster, the inventor of the stereoscope in its present popular form, at once interested himself in the development of his ingenious idea, and a prize being offered by Mr. Nottage for the best essay on the new optical instrument, he became the adjudicator, awarding it to Professor Louie. In 1862 the London Stereoscopic Company undertook the largest contract ever known in connexion with photography, viz., that of the Great International Exhibition, purchasing from the Royal Commissioners, for a large sum, the exclusive rights of producing and selling photographs in the new building. The *chef d'œuvre* of modern sculpture, "The Sleep of Sorrow and Dream of Joy," by Monti, and Magni's celebrated "Reeling Girl," there exhibited, being secured by him from these eminent artists. Mr. Nottage is not unknown in connexion with literature, having some years since published, under the *nom de plume* of "Peraius Junior," a series of amusing and trenchant sketches of character, and also having produced "The Shakespearean Diary," under the initials of "G. S. N."

PHOTO-MECHANICAL PRINTING IN PORTUGAL.

BY M. RODRIQUEZ, OF LISBON.*

THE specimens of photo-lithographs and photo-engraving which I have the honour to present to the Society are not all of them produced by the aid of bichromated gelatine. I employ just now, for making reproductions of medium size, bitumen of Judea dissolved in ordinary benzole to which essence of lavender has been added, so that the evaporation goes on less rapidly, and does not produce any inequality in the thickness of the film.

It is indispensable that the film should be perfectly smooth and even. I employ for the purpose plates of sheet zinc, thin and well polished, and as soon as the solution has been spread upon the surface of these, I warm them to a rather high temperature, until the odour of the lavender disappears almost entirely. I expose in the sunshine in the ordinary way, only I rub the cliché first of all, as also the sensitive film, with a little talc, so as to prevent any adherence. The development of the image is brought about by means of essence of turpentine, after the plate, which may have become heated in the sunshine, is perfectly cool again. I plunge the plate rapidly into the essence, which is contained in a suitable bath, having a contracted bottom, to retain the impurities which may become deposited there.

In most cases only a few seconds are necessary to develop a plate. The development should not be pressed to the farthest limits; it is completed in the time which elapses between the moment when the plate is withdrawn from the bath and that when the washing begins. The

* Read before the French Photographic Society.

operation of washing should be conducted as rapidly as possible by means of a strong and prolific jet of water directed through a rose, so that the water covers at once the whole surface of the plate. After development the image is treated with very weak nitric acid, and then gummed and inked. If the plate is very thin, I make a transfer to stone, and then another upon a thicker plate. If a photo-engraving is desired, a metal plate of sufficient thickness is taken and engraved immediately.

This bitumen process, employed in the photographic establishment of the Portuguese government, is remarkable for the ease of the manipulations involved, and the uniformity and beauty of the results. Nevertheless, I ought to say that for pictures of large dimensions I always prefer the process of bichromated gelatine upon tin plates, the details of which I made known some time ago.

Among the specimens of photo-engraving which I have the honour to submit to the French Photographic Society there are some obtained by the aid of a new process which will, I hope, serve to produce, in an easy manner, typographic blocks with all the half-tones of the originals. The specimens which I have forwarded are incomplete, and my first experiments were only undertaken a few weeks ago; it is only natural, therefore, that by improving manipulations, and modifying the quantities of the material used, prints of a far superior character will be obtainable than those at present.

I mix some sugar of milk, a substance soluble in water or nitric acid—starch, carbonate of lime, or carbonate of lead, answering the same purpose—with essence of lavender and a little bitumen of Judea, and bruise the same in a mortar until a perfectly homogeneous mixture has been obtained. I then mix a sufficient quantity of this paste to the solution of bitumen in turpentine, so as to have a sensitive compound of a convenient consistence. I cover my plate in the ordinary way, having a care not to produce too thick a film upon the surface. I then develop in the ordinary way with essence, and at once put the plate into the engraving basin containing weak nitric acid, similar to that employed in etching for the first time. The acid penetrates the resinous film by degrees, dissolving the substances destined to form a grain, and it acts upon the preparation more or less according to the thickness of bitumen, and this reproduces the half tones of the original. It is only necessary to be careful that the etching does not proceed too far, and that the parts accidentally laid bare, and which nevertheless form part of the picture, are protected by means of varnish or lithographic ink. The ink is then applied, and the engraving is treated in the ordinary way.

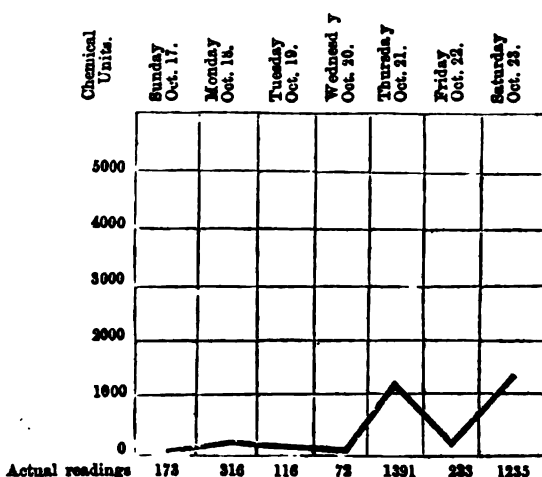
Before concluding, permit me to exhibit some reproductions made by photography of the cartoons of Sequeira, a Portuguese painter of note. These cartoons are of considerable value, emanating from an artist whose loss is deplored by all who appreciate works of artistic genius. The cartoons represent the Adoration of the Magi, the Descent from the Cross, the Ascension of Jesus Christ, and the last Judgment. The negatives were taken by the government photographic establishment, and we shall now proceed to reproduce the pictures by a phototype process.

METEOROLOGICAL REPORT OF THE AGGREGATE OF CHEMICAL FORCE IN THE DAY-LIGHT OF THE SOUTHERN SKY, FROM OBSERVATIONS MADE AT BLACKPOOL, IN LANCASHIRE.

BY D. WINSTANLEY, F.R.A.S.

THE past week has been a dark one, torrents of rain having poured on several days almost without intermission. The daily average has sunk to 505 units, a lower average than I have previously recorded, and on one day (Wednesday) the aggregate of light descended to the exceedingly small amount of 72 units, than which in Blackpool I should apprehend we shall very seldom have

a lower. In all probability the comparatively brighter weather will soon set in, when the daily average will, very possibly, exceed 1,200 units.



A ROLLING STONE'S VISIT TO PEKIN.

BY D. K. GRIFFITHS, SHANGHAI.*

I FOUND the natives of Peking not so shy of the camera as the more docile southerners, and, no matter how retired the corner I selected for my dark chair, thousands of dirty, perspiring, and half naked natives would find me out, pressing around it and peeping into the window, quite obscuring the light by their flat, unmeaning faces. Ex-postulating was waste of time, and it would not do to display perplexity, so I became very indulgent, smiled benignly upon them, and even patted the head of a dirty atom of creation shaped like a baby—and, in short, took a general interest in the staring multitude; but it was of no avail. Time with them was of little importance—indeed, many lit their pipes, and seemed determined to pass the remainder of the day in the company of such a very entertaining foreigner.

The crowd, having satiated its curiosity, got less pacific, and resorted to the playful pastime of pelting me with stones behind my back; and yells of "Yang-quitsa!" amidst jeering calls, sounded on all sides of me, until the grand tableau was completed by a huge missile passing my head while in the act of focussing, smashing the glass to atoms. I then had resort to a mild expedient which I have invariably found sufficient to disperse a Chinese crowd. I told the boy to fetch me a glass and a soda-water bottle, which were handed to me, the crowd intently gazing upon every movement. Leisurely I removed the wire from the neck of the bottle, and with a loud report the cork flew away, and so did the crowd. This very harmless ruse had the desired effect, and I secured the sympathy of the laughter-loving portion of the crowd, while I in no way departed from the distinctive dignity necessary to secure safety in a Chinese mob. The action on my part was usual, while their own ludicrous fear for the moment put them in a good humour with the mild and calmly indifferent occasion of it; so I afterwards sat and smoked a cigar without the slightest insult being offered, while my coolies packed up for my return.

The next day I directed my efforts to the "Temple of Heaven," and dispatched my coolies before me, riding quietly after them as the day was excessively hot; but when I arrived at the place of my operations I found my chair and coolies were waiting outside, the gates being closed against them, and a multitude of idle Celestials collected to get a sight of the "barbarian of the western

seas." I had to pay the gate-men two dollars to get the gates opened, and then felt satisfied that there was an end to my trouble; but—

"God in the nature of each being founds
Its proper bliss, and sets its proper bounds."

And so in the nature of all things Chinese limits are set to our enjoyment of them; and I found my troubles but begun. There was another gate inside, and when the gate-men saw me advance, their naturally slow movements were stirred up to alacrity by thoughts of yang-tseen (foreign money), and rushing to the gates they succeeded in closing them in my face, the men, of course, standing inside to levy another "squeeze," as exorbitant as the first. They would not abate anything under two dollars. A London tradesman could not be more firm in the principle of "no second price." I held out for some time, but thought it best to submit to the extortion, much against Ahee's inclination. I had to pay the same fee—or, as a China-man would more aptly term it, "squeeze"—before I arrived at last in the enclosure containing the grand dome which was the object of my visit. It was two o'clock then, so I had enough to do to get the views I wanted and be back to the Tartar city before the closing of the gates at sun-down, and was only in time by hard riding to effect an entrance. Having completed my series of views illustrating the city, the most difficult part of my task was completed, and I now gave my attention to the surrounding country; and starting from the Sun-she-mun—one of the city gates—first taking a view of Pa-li-chwang Pagoda, *en route*, proceeded to the Temple of Pi-yuen-szue, where I put up for the night in a pavilion kept apart for visitors. It is enclosed in a courtyard which is tastefully laid out in the usual Chinese style, with a pond in the centre skirted with artificial rocks, through which dark, cool paths are cut, leading out at intervals to projecting crags or quiet nooks.

While the boy was getting ready my mid-day meal, I lit a cigar and wandered through those paths and clustering bamboo-groves; it was a quiet romantic-looking little place, and those who laid it out well understood the picturesque. Rugged points of artificial rocks were brought prominently out by the clear azure of the sky, and a group of bamboos, or a tiny temple, here and there broke the sameness, and relieved their barrenness. Undisturbed, I here enjoyed the quiet until my boy announced that "Tiffin have got."

The inside of the pavilion was as inviting as the outside, and consisted of a large and handsome room with polished floors of a dark wood; there were windows of horn back and front, the walls were covered with a light paper, and the dais upon which they had placed my bed was covered with red cloth; a chair was placed ready for me by a small table, upon which a very inviting breakfast was placed; everything in and about the place was surprisingly (as it was unusually) clean, so I sat down with a hearty relish for what the boy served me to, and soon felt sufficiently well developed and fixed to commence work. There was no difficulty in getting the views I desired, the priests were very courteous, and there was no mob to obstruct my operations.

I remained three days in this quiet hermitage before returning by the temple of Woo-fa-szue, where I stayed to get a negative of the "Sleeping Buddah;" then made a slight detour to get the ruins of Yuen-ming-Yuen, the Emperor's summer palace, and then put up for the night in a native inn situated in a hamlet close by, and early in the morning returned to Pekin, taking a view of Ta-cheng (the Great Bell) on my way. Great preparations were being made to celebrate the approaching marriage of the young Emperor, which has been graphically described by Mr. Simpson in the pages of the *Illustrated London News*, and to whom I had the pleasure of an introduction. It is unnecessary for me, therefore, to say anything of this peculiar ceremony, and I only refer to it as presenting

another difficulty to my operations. Indeed, I believe most of the determined hostility I met with in the northern capital resulted from the jealous care of keeping the "barbarian" from practising his black art to the possible detriment of the "Son of Heaven." And it is just possible that many of the sons of Han will attribute his early death to a secret influence exerted upon him by the subtle witchcraft of the professor of the dark secrets.

Dr. Dudgeon, of Pekin, has since published a work in Chinese, giving a concise account of the entire manipulations of the photographic art; and as Prince Kung has written its preface, great good may result by its distribution; but amongst the vast millions of the ignorant their primitive distrust of the wonderful art and its mysterious working must remain a serious obstacle to the safety of the manipulator. Travelling in China is at present dangerous under any circumstances, but is increased considerably to a worker in our art science.

PHOTOGRAPH WORSHIP.*

Who would not be a Queen, a Princess, an Archbishop, or an actress, to be in the position—having been photographed—to draw crowds, even in this dead out-of-season time, to gaze upon and buy your picture? What infinite charm the gay-loving eye appears to gain in the contemplation of those photographs of pretty women which abound in the windows of every shop—in the fashionable west, or in the work-a-day city—which can produce any possible or impossible reason for having them there. And that huge emporium in Regent Street which mixes up, in such delicious confusion, the pictures of the spiritual and the temporal, what hosts of itinerant crowds pause at its windows, and gaze enraptured on the coloured realization of their best fancied actresses. There are photographs of men, it is true, but the demand for seeing them is like the proverbial angels' visit, nor, indeed, as a fancy piece of living work, does a man colour up well enough. A male dancer in a ballet is never charming; his face is always rough and worldly, his hands are always coarse and red. Women, in a theatre, scarce ever criticise the form and feature of a man; but the bosom or hair of a love-sick comedy heroine, or the leg and arm of an extravagant extravaganzas prince, have always a potent charm for the remarks of their sisters among the audience. So women loiter, most of all, before this photographic shrine. So motley, yet so picturesque; its very muddle of mixed subjects gives a zest to the onlooker, for when the eye-wearies—for even the vision of human grace and honest elegance palls in time—of that happy royal group, a bishop jumps on the gay panorama of faces, and he is succeeded by a Clara Morris whose shadow upon the background of her carte looks more like a Scotch terrier sitting up and begging, than the shadow of an excellently formed piece of female humanity. Then if the uninterrupted view of pink stockings, yolept tights, lifts the eye and mind into the fairy region of romping, roaring burlesque; if a Nelly Moon, or a Kate Santley, figure at full length; or a Mrs. Rousby, or an Ellen Terry, show only intellectual faces, you can wander to the more domestic scene of a duchess watching over a sleeping baby! There is food, in these tinted pictures of female beauty and extravagance, for every frame of mind. We conjure with our minds, as we gaze, if, in real life on the real stage, the mistress of our mental fancies is as fair, and her cheek as smooth and mellow in its colour, and we try to recall if the costume we seem to recognise is half as bright and well-looking as it appears now. Or, haunted by the beauty of this photographic ideal, we resolve to rush off and see the real, and see it, too, not in the meagre pretty view as shown on a card, but in real and natural size. All things are lovely in this lovely stage world! When—and here comes in the great mystery of all—do princesses, and royal children, and countesses (or is there

only one countess who figures in the shop windows, rare type of English beauty?) and actresses find time to sit, in innumerable positions, in innumerable dresses, and be photographed? With ordinary members of the human families, a visit to the dentist or to a photographer's studio is held as being almost synonymous, the tooth-drawing, perhaps, being quicker and less irritating to the temper. It is profoundly wonderful, all this. Then, who buys these? Ah! the bachelor has his rooms, while yet they are bachelor's rooms, hung with them; and the lover of the drama selects the picture of her who, to him, interprets best the true poetry of her art. Nor do they live alone at home: in far Japan, these painted studies of the draped and nude occupy their honoured row in the wares of the shop windows; in China, the storekeeper imports them, and finds a ready sale among those who, once the partakers of the revelry of the gilded throng, now suffer the penal servitude of these non-paying mercantile El Dorados. You will find them in the bazaars in the cities of India. Such is the love for them, such is the worship of them, that every trade dips into them, and the chemist, who does not see his way to sell them, finds them on his scent bottles or his sticks of cosmetic! But the human eagles, whose prey is a long gaze at beauty—and beauty unadorned is adorned the most—are always to be found gathered where their treasure is, and it is the proper study of man, which is man, or of woman, which is woman, the casual strayer down Regent Street espies a knot of people at a shop window, he or she will be safe to conjecture that the attraction is a display of photographs of actresses, to be possessed, as the announcement runs—"plain, one shilling; coloured, two shillings each!"

But, in this worship of the photograph, is there not concealed the germs of a taste after art? Laying aside the meretricious element which undoubtedly pervades this worship, still it is the artistic rendering of photographic art, and the artistic blending of design and colour, which attract and fascinate the eye. It is the nearest approach, in the absence of the actual reality, to the realisation of the beauty of human beings. It is high art, unquestionably, the manner in which these photographs are produced, albeit that in perhaps too many cases they tell "a flattering tale."

PERFECT WASHING AND TESTING FOR HYPOSULPHITE.

BY PROFESSOR H. VOGEL.*

A SHORT time ago I paid a visit to a dealer's where I am in the habit of seeing a grand display of photographs. To my astonishment, the show was very small, and the owner explained to me that he had been compelled to reduce his stock of pictures very materially, only keeping a supply, indeed, of pictures greatly in demand, and supplying others when they were ordered; for he had suffered, he assured me, great loss from keeping photographs in stock. He then showed me a number of large pictures, coming from different firms, all of which had been more or less attacked with "yellow fever." I suggested that perhaps his warehouse was not very dry, and he then told me that he had found pictures in packets some of which were attacked in the way I have mentioned, while others were quite free from any such defects; and this happened, he stated, continually, although, time after time, he begged photographers to be more careful in the operation of washing their prints.

More surprising experiences came to my notice when I recently paid a visit to Copenhagen. One of the very first dealers in the city, whose pictures were, for the most part, views from the neighbourhood, showed me hundreds of cabinet pictures which had been attacked with yellowness. They seemed to have less scruples in Copenhagen than in Berlin, for I was informed that these yellow photo-

graphs would all of them be sold—indeed, there were none others for sale.

I have myself seen pictures coming from studios of the most trustworthy character afflicted with yellowness, and under circumstances where the fault could not be attributed either to the card mount or anything else. I have sometimes called the attention of the photographer to the defect, but nevertheless it has not ceased to make its appearance.

"I have a most excellent washing apparatus," a photographer once wrote me in reply, somewhat brusquely, to my well-meant remark; and, indeed, there are very many who believe that with a "good apparatus" nothing else need be done. A greater mistake can scarcely be committed. Even when the pictures are put separately into the water-box they soon stick together again. If the number is large; and in this case, even if the water flows for hours, there is hyposulphite of soda retained in the conglomerate of prints. I have repeatedly examined pictures which have remained a dozen hours washing during the night in a constant stream of water, and it is, in my opinion, necessary to separate the prints in the washing-trough at least three times during the period of their sojourn therein, in order to be certain that they are thoroughly rinsed and freed from hypo. A separation by hand of the pictures in this way helps more than an hour's constant flow of water. Two hundred pictures—say 7 by 9—were permitted once to remain in my work room during the night in flowing water, and they contained, I found, hyposulphite afterwards; a similar number were carefully separated by hand every half hour for the space of a couple of hours, and these proved to be free from hypo. Large pictures, full-sheet size, I have been able to wash free of hypo in an hour.

Some readers may, no doubt, ask how it is possible to know if the prints are properly washed or not. The test is not new, and has already been published, although it may be strange to many still; while some, again, who know of it, make no use of their knowledge, for the reason that they hold it to be unnecessary. The test is a very simple one, and as it is not generally known, apparently, I will describe it once again.

A solution is prepared of one part of iodine in twenty-five cubic centimetres of alcohol, and of this is taken, for the purpose of making a test, half a cubic centimetre, the same being diluted with one hundred and sixty cubic centimetres of water, and forty cubic centimetres of a very thin solution of starch.

The starch is made by taking a test-tube and putting into it a pinch of starch powder, and about fifty cubic centimetres of water. The starch is shaken up with the water until a very thin milky fluid is prepared, and this is brought almost to boiling point. By mixing together the starch and iodine solution, a blue starch liquid is made, which to every cubic centimetre contains $\frac{1}{1000}$ of iodine. The solution, if kept well corked in dark bottles and treated with twenty grammes of iodide of potassium, will keep good nearly a month.

If, now, it is desired to test whether pictures have been properly washed, the prints are carefully taken out of the last rinsing water with scrupulously clean hands; two clean test-tubes are taken, and into each is put one cubic centimetre of blue iodide of starch, and one of the test-tubes is then filled up with the rinsing water to be examined. If the latter still contains hyposulphite of soda in appreciable quantity the iodide of starch is perfectly bleached; while if there is but a very small quantity of hypo in the liquid the blue tint of the starch only becomes a little paler. To judge effectually of the change of tint, the second test-tube is filled up with pure water, in order to compare with the other one. If both tubes are held together against a sheet of white paper, it is easy to tell if the iodide of starch in the tube containing the water under examination has become paler.

* *Photographische Notizen.*

This description which I have given sounds far more complicated than the affair really is. I have always a couple of test-tubes handy, which I use for no other purpose than for testing; these have two marks upon them, the lower one indicating the height of the starch solution, the upper the amount of wash-water to be examined. Both test-tubes should be as nearly as possible of the same calibre.

Water which contains but one millionth part of soda has a perfectly visible bleaching action upon iodide of starch—a good proof of the accuracy of this test, which every principal can employ in a few minutes to ascertain whether his assistants have washed their prints properly or not. No one should neglect to make such a test.

The iodine starch may be used also for the examination of other materials, such as the presence of hyposulphite in mounts and cardboard. Three carte-de-visite cards are cut up small, and put to soak in a vessel of pure distilled water for about half-an-hour; the water is then examined in the same way as I have indicated above. If the blue starch solution is bleached in any way it is a proof that hyposulphite of soda is present in the cardboard. As the test is a most delicate one, it is obviously very necessary that the hands and the glasses employed should be scrupulously clean.

I may remark, moreover, that even with careful washing of the prints, and the employment of pure cardboard, pictures do become yellow at times in the event of their having been imperfectly fixed. Such a contingency many may deem quite impossible, and yet I know the case of a careless printer who used to put several hundred cartes-de-visite into a small bath of hypo to fix, the capacity of which sufficed for the fixing of but fifty prints at the most. The first batch of prints fixed were perfectly good, but the last were yellow in four weeks, notwithstanding the thorough washing to which they had been subjected. A picture of full-sheet size requires, to fix it properly, four to five grammes of hyposulphite of soda.

Correspondence.

WORKING PHOTO-COLOGRAPHY.

SIR.—I have lately been trying my hand at Captain Waterhouse's photo-mechanical printing, but have met with very poor success, and I come to you thinking you may help me out of my difficulty.

I believe I faithfully followed the directions given in Captain Abney's book, but I found it impossible to add the bichromate to the gelatine and tannin solution without making a mess, as I have since found explained by Capt. Waterhouse in the *News* (Vol. XVIII. p. 428); and I have since contented myself with the double operation. I made an actinometer as recommended by Captain Abney, only, not being able to procure the yellow oil silk, I used the green, and exposed until a figure printed on ten thicknesses was well defined on a piece of sensitive albumenized paper (not fumed). This will give some idea of the exposure. The back of the plate was then exposed on a piece of black velvet for fifteen minutes on a dull day.

Upon immersing the plate—a half tone view—in water, the image was distinctly visible, even in the most minute details, and the relief was quite perceptible to the touch. Everything thus far appeared quite successful, but upon applying the dabber with the litho-ink I could get no trace of a picture. I then removed all surface moisture with blotting paper, and tried again. The ink now adhered to the whole of the plate, blacking it all over. Thinking perhaps over-exposure was the cause, I tried again, and stopped at the eighth thickness of silk, and only exposed the back for ten minutes, but with no better result. The gelatine I used was Nelson's opaque. Is this suitable for the purpose? Was the exposure possibly too short? I can scarcely think so, as the print was so beautifully sharp and raised (or, more correctly, sunk) in the film. What length

of soaking is required to eliminate all the bichromate; and if this is not thoroughly done, what effect would it have in the after processes?

I am sorry to trouble you with this long story, but I should be very glad of any information you can give, or refer me to any printed particulars in the *News* or *Year-Books*. I have looked through all I have.—Yours truly,
Teignmouth, Oct. 22nd. W. R. P.

[We print our correspondent's letter for the purpose of eliciting information from any of our readers who may have had experience in this direction. The difficulties encountered by our correspondent are similar to those which beset almost all beginners in this direction, and can only be overcome by experience. The experimentalist must remember that he is engaging in a new branch of technique for the pursuit of which his previously-obtained photographic knowledge and skill are scarcely of the slightest use, and patience and repeated effort are necessary—with, possibly, repeated failure—before success can be anticipated. So far as we can judge from our correspondent's description, he gives over-exposure rather than under-exposure. One of the most troublesome tasks to the novice is "inking up" the printing surface. It is very important to gain an opportunity, if possible, of seeing this done by an expert. When a properly exposed film has been obtained, the inking up requires great care and some skill; repeated spongings and applications of the ink are required to get the surface in a working condition. The object of washing away the unaltered bichromate is obvious. If this were not done, it would all become insoluble together under the gradual action of light. When the washing water is no longer yellow, the bichromate is removed.—Ed.]

SOUTH LONDON PHOTOGRAPHIC SOCIETY TECHNICAL EXHIBITION.

DEAR SIR.—Will you kindly permit me to announce that the Annual Technical Exhibition Meeting of the South London Photographic Society will take place on Thursday evening, November 11th, at seven o'clock, in the large room of the Society of Arts, John Street, Adelphi.

Any one who has anything new and useful for photographic purposes is invited to exhibit and explain the same.

It would facilitate the business if intending exhibitors would communicate with me previously, and that all articles be sent to the place of meeting before five o'clock on the evening of November 11th.

Admission being free on this occasion, all photographers and others interested are invited to attend.—Yours faithfully,

Edwin Cocking, Hon. Sec.

57, Queen's Road, Peckham.

Talk in the Studio.

TRADE PATTERNS BY PHOTOGRAPHY.—Mr. J. W. King, an amateur photographer, has conceived the happy idea of rendering photography available in his own business as a jeweller, by sending out photographic patterns, which are, of course, most admirable fac-similes of the original, in design, texture, and general effect. He contemplates issuing a monthly series of such patterns of jewellery, such as lockets, brooches, bracelets, &c., which may be useful to photographers, to select for portraits, and dispose of in their ordinary course of business. The project seems to be a good one, and will probably succeed. Mr. King's photographic patterns are admirably executed.

INDECENT PHOTOGRAPHS.—At the Surrey Sessions, Morris Gouldberge, aged 26, a dealer, was indicted for that he did on the 21st August expose a large number of indecent photographs for sale in the Lower Marsh, Lambeth, and with attempting to corrupt the morals of youth. Mr. Baggallay, instructed by Mr. Henry B. Pollard, jun., appeared to prosecute on behalf of the Treasury; and Mr. Lilley appeared for the defence. The jury found the prisoner guilty. Mr. Lilley said as this was an in-

portant case towards the public, he had to ask that a case be allowed for the Court of Appeal. The Chairman refused a case for the court above, saying that this was a case which only was to be left to the jury. The case did not call for a severe punishment, and he should order the defendant to find two sureties in £10 each, to come up for judgment if called upon to do so.

A PHOTOGRAPHER'S LIABILITY FOR PORTRAIT LEFT TO COPY.—*Sandys v. Dean*, an action brought in the Southwark County Court, on the 15th inst., to recover £5, the value of a Daguerreotype. The plaintiff had left with the defendant a Daguerreotype of his late mother to be restored, and an enlargement made from it. The portrait was kept for three months, and the plaintiff applied for its return, together with the enlargement he had ordered, when, after further delay and on a second application, the Daguerreotype was returned, but in an obliterated condition, and the defendant would not make any compensation. He would not have taken any money for the portrait, and only brought the present action upon public grounds, and to teach a lesson to photographers to be more careful of the property entrusted to their care. The loss was irreparable. The defendant stated that the original picture was so faded that it was scarcely perceptible, and that he took the usual means to restore it, but without avail. As he could not reproduce an enlargement from it, he returned it to the plaintiff. The Judge said the plaintiff was not entitled to recover a fancy price, which might as well be £500 as any smaller sum. As the intrinsic value of the portrait was about ten shillings, he would give judgment for that amount, but without costs.

To Correspondents.

A NOVICE.—Albumenized prints if left to dry naturally, without any care, inevitably curl up, albumen side inwards, because the albumen in drying contracts more than the paper. To keep the prints flat, it is necessary to take them before they are absolutely dry—just, in fact, before they would begin to curl—and place them evenly in a heap; then place a board on them, and a heavy weight on that, on better still, place them in a press. If each print can be ironed, or put through a rolling-press separately, just before it is “bone dry,” the effect is better still. The same principle prevails, whether simply albumenized prints or enamelled prints are to be dealt with; but there is a difficulty with the latter, as, if they be removed from the glass upon which the enamelled surface is prepared before it is dry, the surface of the print loses something of its gloss. As a rule, enamelled prints are not kept unmounted. Whenever prints are rolled up they should be rolled with the albumenized side outward; this will make the print lie flat when opened out; but if the albumenized side be rolled inward, as is most commonly done, it is almost impossible to make the prints lie flat afterwards without wetting and pressing. We cannot answer with certainty your second question; but we should think they probably would keep with proper care.

C. N. W.—The difficulty of throwing down the silver from washing water arises from the use of too much salt in water containing very little silver. When the quantity of silver is small, and the quantity of water large, the chloride often remains in suspension a long time, just making the water milky. A strong solution of chloride of sodium (common salt) has a tendency, moreover, to dissolve a portion of the chloride of silver, and hold it in solution. Hydrochloric acid is better for precipitating the silver than salt. To aid in throwing down the silver suspended in the milky-looking water, you now have to add a little nitric acid.

P. H. O.—There are several modes of preparing glycoime, the full instructions for any occupying too much space for this column. You will find every detail in our YEAR-BOOK for 1866, and also in some other of our YEAR-BOOKS. The simplest form of gelatine addition to the developer, and a very efficient one, consists in dissolving sixteen grains of gelatine in an ounce of water and an ounce of acetic acid, and adding of this half a drachm to each ounce of a ten-grain iron solution. A very good plan in intensifying with iron is to add a few drops of a citro-silver solution to the ordinary developer. Make this solution by dissolving thirty grains of citric acid and twenty grains of nitrate of silver in an ounce of water. This gives good results, and works clean. There is frequently a slight tendency to weakness in the negatives as the weather gets colder and the light less active. Use an older sample of collodion, and, if necessary, add an extra grain per ounce of gun-cotton. Give longer exposure; take especial care not to wash the free nitrate off the plate by the mode of throwing on the developer. The addition of about twenty grains of sugar-candy to each ounce of developer is a capital aid.

W. B. R.—We are not familiar with the portable studio in question, and cannot, therefore, give an opinion on its special fitness; but there need be no difficulty in constructing such an arrangement. Much depends upon the general construction of the place in the open where it will be most convenient to you to place your sitters. If you can secure a wall sheltering the sitters from the south, then a backboard with canopy extending about five or six feet, will enable you to obtain very good effects. If you find any special difficulty, describe the conditions to us, and we will try to help you.

ROBERT E. SPROTT.—There is no pamphlet on the Albortype process published in the English language, but many articles on the subject have appeared in our pages, and in our YEAR-BOOKS for 1871, 1872, 1874. The latter contains the text of M. Albert's French specification. The details would require too much space for repetition in this column.

S. G.—Mons. Dagron, of Paris, is the chief producer of the microscopic photographs to which you refer. There is no work devoted to the subject that we know of. Various articles have appeared in our pages from time to time on the subject. In our seventh volume you will find several articles on the subject, and a description of a camera for producing them. We believe that some photographers in England produce them, but we are uncertain. Mr. A. Reeves, of 17, Bedford Street, Plymouth, did at one time produce them; whether he does so now or not, we do not know.

J. W. (Rothbury).—The stains on your prints are produced by imperfect fixation. The hyposulphite solution is too old or too weak, or the prints are permitted to remain still in the fixing bath, and so stick together and prevent due action of the solution. Most probably, however, you use your fixing bath over and over. The prints have all the appearance of having been fixed in an old, acid, exhausted solution. The result is imperfect fixation; unstable; insoluble hyposulphite of silver is left in the print, which decomposes under the action of moisture and light, and causes the brown and yellow stains in question. When you blot the print off, instead of leaving it so long wet, the stains do not so soon appear; but it is merely a question of time: they will appear. The only chance of obtaining good permanent prints is, in using a fresh fixing bath for each batch of prints. The *conversations* of the Photographic Society is over, and there will not be another until next year. The first meeting of the session will be held on the 9th of November. Non-members can gain admission if introduced by a member. Non-members are admitted to the Exhibition on payment of one shilling.

WANT TO KNOW.—Engravings, water-colour drawings, or pictures of any kind on paper, as well as photographs, are liable to mould and mildew if hung against a damp wall. Carbolic acid destroys the vitality of germs in low forms of vegetation—such as mildew—and hence a little added to the paste used for mounting is a protection against mildew, which is in reality a fungoid growth. The precise proportion is not important; a small quantity, much smaller than you have used, should suffice. It is probable, after treatment with carbolic acid, that the prints will not suffer again. But prints which had been delivered three years, and probably hung on a damp wall, should not have been returned because of mildew, which is not in any sense a specially photographic defect.

ATHELSTANE BASELI.—There is no work devoted to the powder carbon process. It has been repeatedly described in our pages. The process used by Mr. Faulkner is that patented by Mr. Window, and described in his specification. You will find full details on page 243 of the fourteenth volume of the PHOTOGRAPHIC NEWS. We regret that we have not time to write private letters in answer to questions from our readers.

R. L. D.—It is not necessary, in increasing the proportion of acetic acid in the same ratio as the iron salt, in making a strong developer. A 50-grain developer need not have more than twenty minims of acetic acid. A weak developer, on the contrary, requires an extra proportion of acid. A 12-grain developer generally requires about twenty minims of acetic acid.

RECEIVED.—*Lantern Readings*, by A. Pumphrey; *the Octopus, or the Devil Fish of Fact and of Fiction*, by Henry Lee, F.L.S., F.G.S.; and *Cassell's Dictionary of Cookery*. Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

- Mr. J. GARDNER, Brompton,
Five Views of “Earl’s Court House.”
- Mr. J. LAING, Shrewsbury,
Two Photographs of Sir Watkin W. Wynne.
- Mr. F. SCRIVENER, Ipswich,
Photograph of Mr. Joseph Arch.
- Mr. L. WESTON, Dover,
Two Photographs of Captain Matthew Webb.
- Mr. RUSSELL, Bristol,
Two Photographs of Model Schools at Bristol.
- Mr. G. SYMONDS, Portsmouth,
Photographic Group of Officers of H.M.S. “Serapis.”
- Mr. C. KNEIST, Ryde,
Photograph of the two Donkeys at Carisbrooke Castle.

The Photographic News, November 5, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PRODUCTION AND PRICE OF DRY ALBUMEN—AN EBONY DYE FOR WOOD—SEPARATION OF SULPHUR FROM ALBUMEN.

Production and Price of Dry Albumen.—Our readers may remember that a little while since we called attention to the successful experiments which had been made to preserve albumen or eggs in a dried condition. So promising were the results obtained, that essays were at once made to produce the material for commercial purposes, and at the present moment there are, we find, several large producers of this desiccated albumen. One of the most important of these is the Effner Factory, in Passau, on the Danube, where, we are told, large quantities of the material are now obtained. The contents of eggs are to be had in commerce in powders of three kinds, one of which is the result of drying the egg-matter as it comes out of the shell, the second consisting of pure white of egg, and the third a powder representing the yolk alone. Egg-powder of the first description may be employed by the pastrycook exactly in the same way as new-laid eggs, three volumes of cold water added to one volume of egg-powder producing an emulsion in taste and smell and material resembling freshly-broken eggs. The only noticeable difference is, that on being beaten there is not so much froth, nor is it so lasting as that from fresh eggs. If, therefore, the egg-powder is to be employed for purposes in which a stiff froth is required, a little fresh egg-white must be added. The pastry, we are told, is quite equal to that prepared straightway from eggs, only it is a little whiter in colour.

In mixing the yolk-powder, not so much water is added; but in the case of the white of egg, with which the photographer is the more interested, three teaspoonfuls of cold water must be added to every half-spoonful of albumen powder. This forms the normal strength of egg albumen, and photographers would then dilute it to any degree they desired. For most of their wants the albumen is required in the form of a clear, transparent solution, and for this reason distilled water should be employed for mixing with the powder, and afterwards diluting the solution. For albumenizing paper this preserved white of egg is, according to the *Deutsche Industrie Zeitung*, perfectly suitable, as well as for other industrial purposes. The white of egg powder is apparently more in demand than either of the other two descriptions of powder, for the price charged for it by the manufacturers is considerably higher. The white of egg powder is sold at one mark (one shilling) per 100 grammes,* while the other powders may be had at the rate of eight pence. In respect to the comparison of these prices with the cost of eggs, it may be mentioned that Messrs. Gobley and Prout have determined that the yolk from a fresh egg weighs in all about fifteen grammes, of which 52.65 is water; while the white of egg in one shell weighs on an average 25 grammes, and contains as much as 87½ per cent. of water. The 100 grammes of white of egg powder, which costs a shilling, may, therefore, be said to equal the albumen from at least a score of eggs, so that it is a profitable transaction—in this country, at any rate—to buy our albumen in this form under most circumstances. As our readers are aware, Dr. J. Schnauss, of Jena, has already borne testimony to the value of the dried albumen in the preparation of dry plates; and as it can be employed in small quantities at a time, there cannot be a doubt as to its being economical to use. The photographer employing the dried albumen may always be sure that he has in his hands a material which does not vary in quality or composition; and when prepared in emulsion it keeps good quite as long as the ordinary white of egg solution.

* If we remember rightly, this is nearly the same rate as that of Mr. Thomas's dried albumen.—Ed.

Ebony Wood Dye.—We think that many photographers will be thankful for the recipe for dyeing wood a deep black which M. E. Lauber publishes in *Dingler's Polytechnisches Journal*. Photographs mounted in a dark frame always look well, and it is very handy sometimes to know how a plain wood frame can be turned into an ebony one. Moreover, the dye which M. Lauber recommends for wood staining has the great advantage that it may be applied cold, and, therefore, there is little fear of the wood warping from an application of the liquid, supposing the material has been well seasoned to begin with. A solution of logwood extract in hot water is prepared, in the first place, and to every five litres of it are added two-and-a-half litres of a solution of crude acetate of iron and half a litre of acetic acid. The whole is then warmed up for a quarter of an hour. For light woods the solution should be slightly diluted with water, and as the mixture is applied cold, no special precautions or appliances are necessary.

Separation of Sulphur from Albumen.—Some years ago, the question was raised by several photographers, and Captain Abney among the number, as to the possibility of separating the sulphur from the albumen with a view of getting rid of many of the evils inherent to albuminized pictures at the present day. There is not a doubt, of course, that the traces of sulphur which exist in all egg albumen has an injurious influence upon silver prints, and, may be, is the germ of that yellowness which tardily arises after the prints have been produced for years; for most photographers agree that the hyposulphite employed in fixing prints may be, and is, totally removed by careful washing. The question is, whether the sulphur is absolutely inherent to egg albumen, and forms an integral part of its composition, and whether, if this element were removed, the properties of albumen would suffer? Efforts have already been made by chemists to separate the sulphur from albumen, and Captain Abney himself has, as we know, undertaken a series of chemical experiments to this end; but, as yet, we believe, no success has attended the efforts of investigators in this direction. That the separation of the sulphur seems really possible, in some degree, at any rate, is to be inferred, however, from some interesting experiments made recently with albumen by M. Schützenberger. This chemist has ascertained that pure albumen, when coagulated by heat, always leaves a small soluble residue amounting to from five to seven per cent. of the albumen in the first instance. This residue, he tells us, is of a clear yellow colour, has a bitter taste, and, what is most important to us photographers, contains sulphur. Whether, however, on coagulation in this way the whole of the sulphur is separated, we are not informed; but it is something to know that, under certain circumstances, sulphur may be isolated from albumen. Of course it would never do to have one's albumen coagulated, but Schützenberger's experiments, nevertheless, warn us plainly that we need not give up all hope of solving the problem in a favourable manner one of these days. We shall be in a position before long, we trust, to purchase our albumen not only in the form of a dry powder, but free from sulphur also.

FRENCH CORRESPONDENCE.

Klary's Mode of Lighting in the Studio—A Book on RETOUCHING—HOW TO MAKE RETOUCHING VARNISH—RETOUCHING THE REVERSE OF A CLICHE—PROTECTING A RETOUCED CLICHE.

A FEW days ago I received from a photographer of Alger (M. Klary) a note in which he advised a copy of a book that he has just published upon a new system of lighting the studio, and he asked for my opinion on the subject of his scheme. The pamphlet was accompanied by several specimens taken under circumstances that he described.

I was, in the first place, much struck by the beauty of these specimens, and it was with considerable pleasure that I opened the little work, entitled "Application of a System of Illumination to Photographic Portraits by Means of an Apparatus for Regulating the Light." I found that both the system and apparatus described were of the simplest character, although, at the same time, they were based upon a profound knowledge of light, evidently the result of long and persevering studies. I am not surprised to see that, in publishing the fruits of his works, M. Klary exacts from his brother photographers a small, but at the same time well-merited, recompense to recompense him for his pains. The book is intended for the use of licencees, and these, I feel sure, will not regret the expenditure of the small fee they are called upon to contribute. If I express so powerful an opinion on the work, it is only because the same is shared by the most competent, who are in a position to judge well of its merits. MM. Leon Vidal, Franck de Villecholle, and M. Liebert all agree in rendering their homage to the work, and have publicly expressed their favourable opinion of it. For myself, I bear the testimony all the more readily as the results of the system which I hold in my hands are truly admirable in every way, while the manner in which the light is made to do its part gives them quite a special aspect. I will forward you a specimen, so that you may see that I have not exaggerated in singing the praises of M. Klary's system.

Another work which will not fail to be well received, because it responds to a want which has been general for some time past, is "Photographic Retouching, by a Specialist." The editor of this little work is M. Carotte, and he gives two illustrations from one and the same negative by M. Luckhardt, of Vienna. One of the pictures is a print from the negative as it is fixed and varnished, the other is the same cliché treated according to the method described in the work. In this case there is neither license nor secret in question, and there is no need, therefore, to suppress any of the contents, and I will, for this reason, quote a few of the useful hints which the book contains.

The author advises that the clichés should not be retouched until varnished. The best plan is to obtain a brilliant and solid surface of varnish in the ordinary manner by heating. In no case does he recommend employing a varnish applied cold, which gives a matt surface, and which has the fault of becoming stained, and showing a grain more or less pronounced, while, at the same time, the film is not so hard. He recommends the use of a varnish thus composed:—

A.—Absolute alcohol	...	80 cub. cents.
Powdered sandarac	...	15 grammes
Turpentine	...	5 cub. cents.
Essential oil of lavender	...	4 "
B.—Absolute alcohol	...	22 cub. cents.
Ether	...	2 "
Powdered camphor	...	5 grammes
Distilled water	...	10 cub. cents.

The two solutions are mixed together, and allowed to remain for a few hours; the mixture is then filtered through paper before being used. The dissolution of the gum sandarac takes place very easily in absolute alcohol, and the addition of water to the alcohol in the second formula has the effect of rendering the varnish less thick and less opaque. As it gets older the varnish becomes harder and harder, and it is necessary that the hardness of the crayon should correspond to that of the varnish. In those parts where the crayon does not take very well the film is rubbed with a little finely powdered pumice, or sulphate of baryta.

Very excellent results may also be obtained by varnishing the reverse of the cliché, and then lightly rubbing the defective parts with pumice, which are afterwards retouched by stumping them with crayon powder mixed with fine pumice powder, the same being applied either with a stump or a tuft of cotton wool. In the case of a vigorous negative treated with pyrogallie acid, the pencil

is not always sufficient, especially in the very transparent parts. In this case the specialist recommends the employment of Indian ink diluted with water and gum arabic to which a little glycerine has been added. By adding more or less gum you increase or diminish the intensity of the colour, which is applied by means of a brush, taking care only to take up a very small amount at the time, and to allow each film to dry before it is covered a second time. With this same colour mixed with gum you may paint of uniform tint all the too transparent parts of the arms, hands, and hair, which would come out too dark in printing.

In retouching clichés which are to be much printed from, the author recommends the following plan. You take some yellow amber varnish, which dries very slowly, and add thereto a little oil of turpentine; this is filtered well, and applied to the negative either in a warm or a cold state. The film is allowed to dry away from the dust, and then you proceed to retouch with the pencil, or the brush, after a day or two has elapsed. When the retouching is finished, you varnish the negative a second time with ordinary varnish, heating the cliché slightly. This second film of varnish completely protects the retouching against the wear and tear of much printing. A negative treated in this manner may be sponged without fear of injury.

The author thus passes in review all the details of the important operation of retouching, and describes with clearness and preciseness the practical manipulations involved. One of the chapters in the book is devoted to retouching negatives by means of collodion tinted with aniline dye according to the plan practised by M. Fritz Luckhardt, of Vienna.

In conclusion, I may say, that such a book as this ought of necessity to form part of the library of every photographer.

ERNEST LACAN.

THE MYSTERIOUS PHOTOGRAPH.

[Our facetious contemporary, *Funny Folks*, has a curious communication on the perplexities arising out of the instability of photographs. If Colney Hatch claim another inmate, as seems probable, the producer of the faded photograph will, it is manifest, be responsible.]

"An occasional correspondent writes from Inverness, N.B., to the following effect:—"Sir,—I take the liberty of asking your advice in a very perplexing case of disputed identity. A week or two ago I bought at the shop of a stationer, who was selling off his stock, a miscellaneous collection of prints, drawings, photographs, &c. Amongst these was a three-quarter length photographic portrait of a masculine figure seated in a chair, and dressed in black, or, at least, very dark clothes. There was no name nor date upon the portrait, but I judged it to have been taken about twenty years back. It was considerably faded, and especially so, I regretted to find, in the important region of the face. I purchased this under the impression that it represented Signor Mario; but a more leisurely inspection induced me to believe that it was meant for Dean Stanley. I found it so difficult to decide to my own satisfaction which of these the photograph was actually taken from, that I resolved to submit it to a friend upon whose judgment I could rely, when he added to my perplexity by declaring his firm conviction that the portrait was not that of either of the two eminent persons I had named, but of Lord Palmerston! Another visitor at my house was equally confident that the features, so far as they could be discerned, were those of General Havelock. Beginning now to see that a cloud of mystery rested upon the question, I became very anxious to remove it; my interest and anxiety increased proportionately with my difficulties, until I felt that I could not rest until the matter was definitely settled. I therefore applied to another friend, who, having inspected the portrait through a powerful magnifying-glass, returned it to me with the gratifying assurance that he had solved the problem at last. The portrait was that of the late Mr. Rarey, the celebrated horse-tamer. There the matter rested, and so did the portrait on my mantelpiece, until my elder brother, on arriving from Ireland, happened to cast his eye upon it. "Who's this?" he asked, taking it up. "Oh, I see; Longfellow. Looked much younger then—didn't he? It's terribly faded, though." This upset all my previous conclusions. I said nothing, but devoted a considerable time to getting together all the portraits I could of celebrities who have flourished during the last twenty

years, and comparing them with the photograph. The result of this investigation was that unless the portrait were that of Sir Michael Costa or Lord Macaulay, I must give the matter up for a bad job. 'Meanwhile, my nephew, who is an amateur photographer, volunteered to remove all my doubts by applying a test only known to adepts in his art. I assented with reluctance, fearing that he would do something or other to the portrait which might injure its likeness to the original. So it proved; for he submitted it to the action of certain strong chemicals, and returned it to me in a few days fainter and more colourless even than before, but with the confident assurance that he had established, beyond all question, the fact of the portrait being that of Charles Kean. But by this time I had lost all my confidence in human judgment. My perplexity is still as great as ever, and at present I am divided between Mr. Frith, the painter, and the late Sir James Brooke, Rajah of Sarawak. Oh, sir! do—do tell me what course to pursue in this distressing dilemma. Upon your infallibility, as Editor of *Funny Folks*, I rely as a last resource. I cannot come to London just now, and the portrait is too valuable to trust out of my own hands. I shall be, therefore, greatly obliged if you will come down to Inverness, and spend a few days in trying to elucidate the mystery. Your travelling expenses need not be more than five pounds, and there are some capital hotels in our neighbourhood. Come—come! and by your wisdom restore peace to the distracted mind of your most attached

"QUENTIN QUANDARY."

"We fear we must decline our correspondent's hospitable offer. We would advise him to transfer it to the Editor of the *Photographic News*, a courteous gentleman, with a voracious love for his art, and a voracious style of dealing with it. He would, no doubt, go any lengths to solve so interesting a problem, and be glad of the opportunity. If not, we can only advise our correspondent to reduce the number of his candidates to two, and then settle their claims by Metallic Arbitration; in other words, 'toss for it.'—Ed. F. F."

"Of course we appreciate deeply the estimate formed by the Editor of our contemporary of our devotion to our art, and are duly grateful; but we must, we fear, decline going to the extremes he suggests!—Ed. PHOTO. NEWS.]

PORCELAIN COLLODION.

BY M. D. POKORSKY JORAVKO.*

THIS collodion, to which I have myself given the name of porcelain collodion, is prepared by mixing together

Collodion, with 1½ per cent pyroxilin 80 gr.
Gum myrrh 1.50

I allow the gum to dissolve, shaking it from time to time, and then let the mixture clarify by standing. By putting the material upon glass, as in the case of ordinary collodion, a uniform white film is obtained, having the appearance of ivory or fine porcelain. Transparent positives upon glass have a most charming effect with this collodion, and gain much in harmony and detail, whether examined by daylight, or by means of a lamp.

The porcelain collodion may be used for several purposes; if, after drying, it is covered with two or three applications of varnish, the film becomes very firm and stable. A glass plate covered in this way with a film of the collodion may be substituted for the ground glass in the camera, and answer very well for focussing with.

The collodion may also be coloured with the aid of aniline colours, and, so tinted, may serve as a basis for transparent positives, to which it gives the most varied and charming effects. Upon the subject of colouring the film in this way it is impossible to give much information; but, as the aniline pigments dissolve readily in spirits of wine, it is easy to obtain an alcoholic solution of any of the tints. This solution is then added, drop by drop, to the collodion until the desired depth of colour has been attained

PRACTICAL PORTRAIT PHOTOGRAPHY.

BY WILLIAM HEIGHWAY.

CHAPTER XXIII.

THE RECEPTION ROOM—HINTS TO SITTERS.

ALTHOUGH it is necessary to attract customers to our gallery, it is of greater importance that we retain them

* *Moniteur de la Photographie.*

when we have secured their attention to our work; therefore our great care should be to satisfy them in the quality of the picture, rather than to gain a transient victory over their senses by a display of elegance in the fittings of the "reception room." I do not at all hold with a slovenly, shabby room for this purpose; but it should certainly not be furnished at the expense of the skylight and its apparatus, nor be bedecked with money that would have been wiser spent in making complete the working departments of the business. The attraction should lie in the quality of the pictures produced, and success will be lasting.

The reception room.—Let this apartment be thoroughly cheerful; and under the charge of a lively, good-humoured, and business-like direction a large store of "expression" may be always secured. From a business point of view, I am decidedly in favour of a gentleman having control of this department—one who thoroughly understands what can be done, and what cannot, so that rash promises are never made. A man, too, has more influence over the wavering mind of the sitter, and can often induce a larger order than was originally intended.

Judicious choice of furniture and fittings, and the exercise of taste in arrangement, will often produce a charming effect with comparatively little expenditure.

Let your furniture be good of its kind, avoiding tumble-down gorgeousness and treacherous "elegance" of upholstery. If you have the artistic feeling a photographer should have, you will strive to secure in the carpet, wall decoration, pictures, curtains, furniture, and surroundings, a thoroughly harmonious and tasteful effect.

Specimens of the work of the gallery should be hung in frames on the wall, and especially should be prepared one of the different styles from which customers can make choice. This specimen frame may be numbered to correspond with a duplicate frame in the skylight, so that a number on the sitter's order will indicate what is required. Here the artistic knowledge of the reception room attendant is brought into play, to suggest a suitable style, or to urge against the selection of an unsuitable.

A glass show-case is necessary for the preservation of coloured work, frames, mounts, passepartouts, &c., and a table for specimens, books, newspapers, magazines, and albums, for the beguilement of customers waiting their turn for sitting.

Little accessories—as, for instance, a fountain, flowers, or a case of ferns, a singing bird, &c.—may be introduced to form a very pleasant feature, and tend to do away with a great deal of the business-like character of the room.

Dressing rooms and lavatories should be convenient, nicely fitted, and kept scrupulously clean and well tended. These necessary rooms are in so many galleries not only very imperfect in arrangement and thoroughly inconvenient, but in such out-of-the-way places as to be almost a protest against the necessity for their existence; whereas they should really be as well furnished in every respect as is possible.

BUSINESS HINTS.

In photography much depends on the impression produced on the minds of sitters by the manner in which they are received, and the surroundings of the gallery. The first and most lasting impression is made in the reception room, therefore it will be only necessary here to remind you of the importance of cleanliness, neatness, politeness, and the ease of manner alluded to elsewhere as tending so much towards setting sitters at their ease, and charming "expression" (that bane of the photographer's existence) into sweetest serenity.

Appointments should be encouraged; and in the order, regularity, and absence of hurry attending them, when strictly kept, the old awkward regime of promiscuous "dropping in," with the undelightful uncertainty attending, will pass away. The convenience and benefit to sitter and artist alike will surely be recognised by all who try it.

A sitter's order book should be kept. The handiest form is a book with pages perforated down the centre, the out-

side half of each page (numbered consecutively) forming a receipt to the sitter, and containing the number of pictures required, style, and the date and time of appointment—the counterfoil being retained in the book for reference.

Re-sittings.—This is a question on which there is a great difference of opinion, and one on which a great deal may be said on the side of the public and the photographer—especially the latter. *If the picture is a bad one*, of course give another sitting; if a good, but unsatisfactory, I think it is better to give the demanded second, or third, or—sitting. You see we are on the horns of a dilemma: the customer says, "Another trial, or you lose my favour and custom;" and it goes hard with us to decide whether it is better to lose our time or his love.

SUGGESTIONS TO SITTERS.

When the sitter comes to secure an appointment, the reception room attendant is often questioned as to the suitability of a certain article of dress for the purposes of photographic portraiture, or it may be noticed at the time of the first interview, that certain points in the attire of the customer may be happy, or unsuitable, and suggestions made thereon. To do this successfully some artistic taste and knowledge of photographic requirements are necessary.

Sitters are generally willing to allow the photographer to be master in his own skylight if that position is maintained with dignity and firmness; and it is only where self-reliance is wanting in the photographer that customers will think of airing their crotchets. There is of course a class of sitters who have decided opinions on art, and it must be the photographer's art to have as much his own way as possible, even when appearing to give in to the ideas of the sitter. Other persons there are who, having seen and admired the photograph of a friend, must have one exactly similar, without giving a thought as to the suitability of the treatment in their case. This is one of the photographer's thorns; for satisfaction seldom results either in copying another picture, or in the modification sanctioned unwillingly by the sitter. Remember, "he that complies against his will, is of the same opinion still." Then there are those who rush into a gallery, hot, tired and fussy, declaring they have only a few minutes to spare—either there is a train to be caught, or an appointment to be kept. Under these circumstances success is extremely rare, and the sitting merely a waste of time.

The photographer should strive to impress on his patrons the fact that much depends on them, in their willingness to submit implicitly to him in all matters of detail of the portrait, and not a little on the temper in which sitters enter the gallery: if worried, or in a hurry, the anxiety will tell its tale in the expression stamped on the picture.

A bright day is not necessary or always desirable, the light on many cloudy days having more actinic power than the yellow glare of the beautiful sunshiny day.

Dress.—The real secret of success in this respect, so far as the photographer is concerned, is that the sitter is not "dressed for the occasion." Even in the event of the alteration of costume being for the better (as a matter of taste), the identity of the sitter is lost. Some sitters enjoy a comic misery in the choice of jewellery in which they bedeck themselves, and generally put on too much. No is this vice monopolized by those vulgar beings on whom we look down with the pitying scorn of superiority.

Remember always that the face makes the picture, and the dress, at best, is merely an aid to picturesqueness.

Some of the finest photographic portraits have been made where the shoulders of the sitter have been draped with a shawl, lace, cloak, or not unfrequently a photographer's curtain. I would advise every photographer to have ready several pieces of drapery in different shades, of material which will fall in good folds. For this purpose nothing can be better than thin flannel or cloth.

Of ladies' dresses, repps, poplins, silks, and satins, naturally fold or drape well. Materials with too much gloss should be avoided, the contrast in light and shade being harsh and inartistic. Striped and boldly spotted dresses, and those with large patterns, should never be permitted, the effect in a photograph being too bewildering. Harmony between the complexion and dress should be studied, and, in regarding this rule, extremes of complexion are not exaggerated.

Of the colours, scarlet, claret, light orange, slate, magenta, crimson, buff, pea green, plum, dark purple, navy and mazarine blues, dove, ashes of rose, china and rose pinks are excellent in photography, being reproduced as light and medium greys.

Snuff brown and dark Bismarck generally appear darker than a black silk or satin, and detail is almost always entirely lost.

Lavender, lilac, sky blue, and French blue are also to be avoided, as they are more troublesome in their white blankness than even pure white drapery.

In the dressing of the hair, avoid change from the ordinary style worn. A long face is considerably lengthened by the arrangement of the hair piled up on top of the head, and a broad face will appear much more so if the hair is brought down over the forehead.

The painful straight lines of a long neck may be considerably improved, in the case of a lady, by the adjustment of curls to break the line. Sometimes it is advisable to drape a lace shawl over the head, and supply compensating lines by its folds.

Powder is useful, but must be carefully used, on red, very black, and sometimes on very light hair, where, but for its use, detail would be wanting; but do not give the sitter's head a frosted appearance.

General remarks to the operator.—Do not make of the head-rest an instrument of torture.

Be firmly, but gently, master of the situation. Quietly combat unreasonable whims. Try to keep the sitter's mind from dwelling on the fact that he or she is sitting for a portrait, and don't permit any unnecessary delay to arise between the completion of the pose and the exposure of the plate.

Do not allow the interference of fussy friends—indeed, forbid their presence in the atelier.

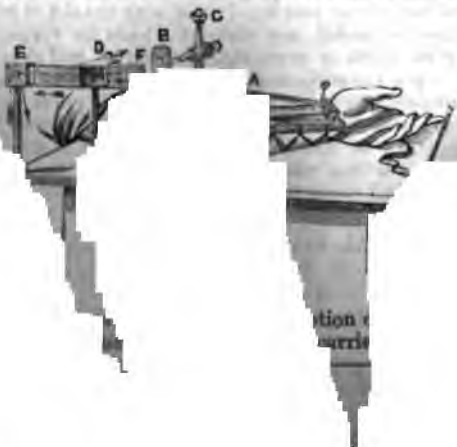
Encourage the confidence of your sitters by a masterly treatment of your work.

And above everything, and through every provocation,
KEEP YOUR TEMPER.

CONTRIBUTIONS TO MEDICO-PHOTOGRAPHY.

BY DR. S. T. STEIN, OF FRANKFORT-ON-MAINE.*

ONE of the principal defects in the Marcy sphygmograph is the friction of the pen against the paper. I have endeavoured to substitute for the pen rays of light. I have given a sketch of an instrument constructed to this



little screen of cardboard (B) which has a tiny perforation in the centre. I have given a sketch of this screen also (fig. 2), which is here shown twice its real size. At C there is a magnesium lamp with clockwork arrangement, whose rays are made to fall by means of a lens upon the screen where the little perforations exists. By moving the lamp and the lens, a concentrated circle of light is produced two centimetres in diameter. In the day-time sunlight may be substituted for that of the magnesium lamp. At D there is a little photographic apparatus, and at E a simple clockwork arrangement. In the little square camera is fitted a lens which receives the picture of the light falling through the perforation of the screen, reflecting it upon the ground-glass at the back of the camera, which is left out in our sketch. By pulling out the camera, and approaching the lens to the screen, the perforation appears comparatively larger upon the ground-glass, and the light spot is diminished in size by a contrary operation. The dark slide running in a groove is seen at F, and this is pulled gradually forward by the cord attached to the clockwork at E, which is capable of indicating the speed at which the slide is drawn along. The magnesium light is quite capable of impressing the sensitive plate instantaneously, and the action of the photosphygmograph is as follows:—When the instrument has been placed in position upon the pulse, it is screwed to the arm, and the working arrangement thrown out of gear. The point of light from the magnesium lamp is sharply focussed upon the ground glass by means of a good magnifier. Under a good focussing glass the light must appear in the shape of a sharply-outlined, illuminated circle. The clockwork arrangement at E is then set in motion, until the dark-slide, F, is drawn into the place vacated by the ground-glass. The slide is then drawn to expose the plate, whilst the pendulum is stopped for an instant, and the lens is capped. The pulse is then allowed to act against the lever, and the screen B at the end moves up and down. Everything being ready, the clockwork is set going, the lens is uncapped, and the curve made by the light falls upon the moving sensitive plate in the camera. The image is then developed and treated in the ordinary way.

I have further improved the apparatus of late by saving the lever, and thus reducing the friction to a minimum, I place the perforated screen B direct upon the pulse, as shown in fig. 3, and enlarge the curve, as was done by the



Fig. 3.

lever, with the aid of a little lens. The clockwork pushes the slide fifteen centimetres in fifteen seconds. If the plate moves faster, the curve elevations are rendered narrower; when it goes slower, these elevations are broader. In fig. 4 we have an accurate reproduction of



Fig. 4.

an image obtained in a photosphygmograph, the pulse beating seventy-two to the minute; in the middle of the exposure, the *Arteria Brachialis* was compressed for a few seconds, and hence the line produced. The breadth of the curve shows the rapidity of the pulse, the height of the curve the vigour of the blood-waves.

Two other pictures, figs. 5 and 6, show, respectively, a heated pulse and a slow pulse, both pictures being taken

with the same patient. Fig. 5 represents the more excited pulse. The form of the curve shows that there is a treble

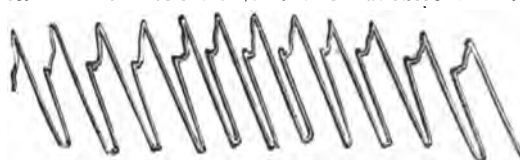


Fig. 5.



Fig. 6.

beat in each pulsation, a phenomenon which cannot be without its scientific value. Light is, we see, more sensitive, therefore, than our fingers.

In the same way as the action of the pulse is photographed, so can every motion of the human body be recorded also, and experiments have already been made upon various animals. If the artery of a living animal is opened, and placed in contact with a mercury reservoir contained in a rubber bag, the mercury in the tube of the reservoir rises and falls with the action of the blood in the animal's system. A cork floated in the tube on the top of the mercury column, and having a wire leading to the top, with a little cardboard screen at the extremity, similar to that shown in fig. 2, allows of records being secured of the up-and-down motions, or ebb and flow power of the blood. In this case, the screen with the perforation is arranged for photographing with apparatus similar to that shown in fig. 1, and curves of a like nature are received upon the sensitive plate.

Photographic registration of temperature.—As is well known, the temperature of the human body is continually rising and falling, in the case of fever patients to a marked degree, and the careful observation of temperature with sick persons is a matter of great importance. Now-a-days, the glass thermometer is usually employed for taking the temperature of patients, the records being taken to a tenth of a degree; but as the physician cannot always record the temperature himself, implicit reliance cannot be placed upon the observations made. An instrument has therefore been constructed which is capable of telegraphing the temperature of a patient to a distance, and to photograph the results automatically. The apparatus is based upon the principle of the thermo-electric pile.

It is a known fact that if two different metals be soldered together, and the temperature of the junction is different to that of the extremities, an electric current is generated of a force proportional to the heat at the place of junction. If now a composite bar consisting of a number of wires soldered together be placed under the arm of a patient, and the other end maintained at an even temperature—say in boiling water, or in melting ice—an electric current will be generated, proportional to the bodily temperature of the patient. This current is led to the needle of a galvanometer, which indicates the decrease, or increase, of temperature in the patient. Even if a very long wire is used for conducting the electric current, the needle swings freely, and gives marked indications. To obtain a photographic result, the galvanometer is put into a dark room, and the magnetic needle connected with a tiny mirror upon which a stream of light is allowed to fall; and as the needle is set in motion the light ray moves also. A sensitive plate is arranged so as to receive the moving ray of light, and a curve is formed which corresponds in height and depth to the strength of the electric current, and the warmth generated by the patient. Instead of a sensitive plate, a cylinder with silvered paper may be employed, which makes one revolution in twenty-four hours, and in this way a daily register of the patient's condition is secured, which contains a record of every quarter of an hour.

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RIGHTS OF PHOTOGRAPHIC PARTNERS.

A CURIOUS case, of some interest to members of partnership firms generally, and especially to partners in photographic firms, recently came before Mr. Knox, the police magistrate at Marlborough Street Police Court. So far as we glean the facts from the report of a daily contemporary, the two gentlemen involved, both of whose names are familiar to photographers—Mr. Herbert Watkins and Mr. Edward Haigh—had been in partnership as portraitists in Regent Street, but, not agreeing, had terminated the partnership. Mr. Watkins retiring, and Mr. Haigh retaining the business premises and, presumably, the business connection. Under such circumstances the latter gentleman naturally—as many will think—opened the letters from old customers sent to the business premises, even when they bore the name of the old partner—a proceeding which subjected him to a criminal charge in a police court. The important point to know here—a point in regard to which the report of the case is silent—is, whether any agreement on the subject had been made, either as to the retention of the connection associated with the business and place, or whether such letters as those adverted to should be forwarded to the retiring partner. If, in retaining the business premises, the remaining partner was presumed to retain such connection as might append to them, the opening of business letters, no matter how addressed, would seem a very natural thing, and in some cases the only aid to the retention of the connection. It is by no means an unusual thing, in the sale and transfer of businesses generally, and of photographic businesses especially, to continue the business under the old name, and in such case all communications addressed to the old name would be dealt with by the new holder as naturally appertaining to the business. In the case in question it is manifest that Mr. Haigh acted under the impression that business letters sent to his premises, although addressed to the retiring partner, belonged to the business, and he opened them accordingly. Mr. Watkins, on the contrary, having a very decided impression as to his own rights, preferred a charge of theft against his former partner. The case was eventually compromised, and the summons withdrawn; but that the proceeding had involved serious risk to the remaining partner was rendered evident by the expression of opinion of the magistrate in allowing the compromise in question to be carried out. We append the police report as it appeared in the *Daily News* :—

At Marlborough Street, Mr. Edward Haigh, photographer, Regent Street, was summoned before Mr. Knox for stealing a letter and envelope, the property of Mr. Herbert Watkins, photographer, Torrington Avenue, Camden Road.

Mr. Bartlett appeared for the complainant, and Mr. Wright for the defendant.

From the evidence it appeared that the complainant and defendant had been in partnership in Regent Street as photographers. Disagreements took place between them, and a dissolution of partnership followed. Subsequently the complainant had a belief that the defendant was in the habit of retaining letters sent to the house in Regent Street from old customers, directed to him in his own name. The complainant spoke to the defendant on the subject, and also gave notice to the Post Office. With a view to obtain proof positive, a letter was prepared and sent to Regent Street, asking on what terms certain photographs could be supplied, specially directed to the complainant. A person named M'Nair, who had been in the service of the firm, and was then in the complainant's employ, called on the defendant and saw this letter lying on the table opened. M'Nair had seen the letter before it was sent to defendant directed to complainant, and knew it again. The answer to the letter was received by the young lady who was supposed to have sent the letter.

A witness named Corrie said she received letters for the defendant, and sometimes for the complainant, but she could not swear that she forwarded the letter in question to the complainant.

A copy of the letter in question was put in, and the case was adjourned for the attendance of the young lady who wrote it.

When the case was resumed,

Mr. Bartlett stated that a certain agreement had been arrived at between the parties which, if carried out properly, was all the complainant required. He had, with the magistrate's permission, to ask for the summons to be withdrawn, it being understood the defendant was no longer to make use of the complainant's name in connection with the business.

Mr. Tindal said the defendant opened the letter under the impression he had a right to do so.

Mr. Knox, in permitting the summons to be withdrawn, said the complainant was quite justified in bringing the matter forward. After what had been stated he would not send the case for trial, as he considered a conviction doubtful, but he must say he thought the defendant's conduct very wrong.

THE PHOTOGRAPHIC EXHIBITION.

ENLARGEMENTS.

THERE is nothing in the present exhibition in which definite progress is so fully illustrated as the examples of enlargement. In much of the work in the regular grooves of photography—such, for instance, as the ordinary samples of portraiture and landscape—the best of the contributions do not transcend in quality those of the last few years, whilst in subject pictures and pictorial compositions this year's examples, with two or three exceptions, fall far short of the work which has been exhibited for years past, some of the attempts being absolutely depressing in their lack of every art quality. In enlargement, on the contrary, the last few years have shown the most marked advancement, and this year fully equals, if it does not surpass, the high standard of excellence attained in the last two or three exhibitions. There is also an important lesson suggested by this year's contributions. It is shown tolerably clearly that to attain success in a special branch like enlargement, special experience, if not special appliance, is necessary. Here, in almost every instance, the successful work has been executed by some firm which devotes itself especially to the work of enlargement, and so becomes master of the conditions necessary to success, in a degree almost impossible to the photographer undertaking the work occasionally at more or less distant intervals. It is further significant, and worthy of note, that by far the greater part of the enlargements exhibited are in carbon, the stability and the excellence being worthy companions.

Claiming priority on many grounds, not the least of which is that of pioneering in a most important method of enlargement, are the numerous contributions of the Autotype Company, or, rather, Messrs. Spencer, Sawyer, and Bird. These are, of course, all in carbon, and many of them are of magnificent proportions, falling little short of four feet in length by three feet, or nearly, in breadth.

They include landscapes and portraits, and it is difficult to say which impress us as the most perfect. Amongst the landscapes are a couple of admirable views on the Thame, the negatives by Marsh Brothers, of Henley, in which no element of excellence in a small direct picture is here wanting in the enlargement: foreground and foliage, rippling transparent water, variegated by bridge and bushes, sky with perfect aerial effect, all tending to produce fine pictures as well as good photographs: and these may be fairly taken as typical of the landscape enlargements. A couple of these possess points of especial interest: they are enlargements from calotype negatives by Mr. B. B. Turner, whose pictures in the early days of the art were very highly estimated, and the enlargements now produced and exhibited show how justly. No. 311, "The Head of the Lake Losely Park," a print from the original negative of which was hung at the Society's Exhibition in 1854, is an admirable picture: delicate, vigorous, harmonious, and full of atmosphere, the latter quality being enhanced by the texture of the paper inevitable in a Calotype negative. Another example, "Scotch Firs" at Hawkhurst, an original of which was hung at the first photographic exhibition, held in the rooms of the Society of Arts in 1853, is also very excellent. Amongst the many noble examples of enlarged portraiture exhibited by the same firm, it is difficult to make selection where all are so good. No. 208, from a negative by Mr. Wm. Locke, secures general admiration as a charming subject, as well as a perfect enlargement. In this picture we are reminded of a noteworthy fact in relation to the majority of the examples sent by this firm: they are, in contradistinction to many other of the enlargements, chiefly untouched, or very little retouched. Those interested in estimating the effect of retouching may see an enlargement from the same negative at the door of Mr. Lock's establishment in Regent Street, very fully and admirably retouched, whilst the example in the Exhibition has received but little assistance from the hand of the artist, but is, notwithstanding, in every way a charming picture: a beautiful face, which in pose, expression, and arrangement of drapery, all add to the picturesque effect; admirable in light and shade and gradation of tones, it is perfect as a picture as well as an enlargement. No. 8 is a singularly fine example of portrait enlargement by the same firm, as is 195, a singularly delicate enlargement of a little boy, somewhat spoiled in effect, however, by the gorgeousness of the frame.

Similar in general style of enlargement, and also printed in carbon, is a fine series contributed by the Woodbury Printing Company. Many of these are very large and very beautiful, having the advantage of production from some of the choice negatives of Messrs. Locke and Whitfield, to which the amplification does the fullest justice. No. 14 is a very fine specimen of the work of this firm, perfect in modelling, delicacy, and finish. All the contributions of this company are portraits, and they possess a singular uniformity of excellence, which might be described by the paradoxical remark, that whilst some are better than the others, there are none which are worse. Messrs. Marion and Co. also send some very fine carbon enlargements, of which No. 2 (Sir Bartle Frere, K.C.B.), and No. 36, a portrait of the Prince of Wales, secure the most attention and admiration. Messrs. Robinson and Thompson, of Liverpool, send a couple of very fine carbon enlargements of distinguished musicians, one of Miss Rose Hersee, and the other Signor Carl Rosa, both specimens of capital work. A number of very fine carbon enlargements are sent in by Captain Horatio Ross, comprising studies of rocks, landscapes, and deer, all picturesque and effective, and fine enlargements. Lombardi and Co., of Brighton, send examples in carbon and silver, both excellent; a fine portrait of the Marchioness of Huntley, and one of the present Speaker of the House of Commons, Mr. Brand, in carbon; and an exceedingly effective picture of

the Viscountess Dupplin, in silver. Messrs. W. and D. Downey also send fine carbon enlargements, groups of the Duchess of Teck and her children being in every way satisfactory. Messrs. Murray and Heath send a very good enlarged portrait of Mdlle. Alboni, which is hung too high for careful examination. Mr. Mayall sends a number of excellent enlargements, which probably are the only examples of solar camera work in the exhibition.

Mons. Lambert sends several examples of enlargements presenting marvellous results, and illustrating the curious facilities which his mode of working permits. In No. 3 we have a capital portrait of a pretty Normandy fish-wife in her holiday dress: this is enlarged from a minute head, forming one in a card group of twelve persons. In No. 13 we have a couple of heads, one of which is a portrait of Morse, the celebrated American electrician, reproduced from small Daguerreotypes. In a third frame (No. 45) we have a fine enlargement, in which not simply a new background is introduced, but a sleeve is added to the lady's dress! A print from the small negative is shown in an evening dress with short sleeves and uncovered arm, whilst in the enlargement the arm is duly draped without any possibility of discovering the mode of patching. Other examples are copies from small photographic prints. Mons. Lambert seems to have set himself to seek the most difficult possible of tasks, for the pleasure of overcoming them: That he has not simply combated, but overcome, is manifest from the examples, all of which are good, and many exceedingly beautiful.

Mr. Croughton sends examples of his "memotint enlargement" which are highly finished and effective, presenting the appearance of fine direct prints. Mr. McLiesh's enlarged studies and portraits are very interesting. They appear to be collodion transparencies backed with tinted paper, and are, besides being effective, artistic and pleasing in general effect. No. 152 is very interesting. It is an enlargement by Mr. G. Penny, of Cheltenham, from one of his negatives on Kennett's pellicle. It consists of a group of several figures scattered over a fine landscape. The perfect definition and delicacy of the enlargement speak much for the definition and delicacy of the gelatine negative. Mr. H. Dixon sends enlargements and prints from original negatives of some very interesting pictures of the officers of the *Alert* and of the *Discovery*, now in the Arctic regions; giving admirable photographs of many frank, manly faces who give promise of being equal to the work they have undertaken.

There are a few other enlargements, but we must not omit to mention some by the Royal Engineers at Chatham, which are not inferior to any exhibited. No. 295, "Ramesis, Thebes," is a singularly perfect picture, which few observers would dream of regarding as an enlargement; and No. 274, "Phileas," is scarcely inferior. We hope to be able shortly to say something more about the process and pictures.

SIR CHARLES WHEATSTONE AND THE STEREOSCOPE.

THOSE members of the Photographic Society who, coming into contact with Sir Charles Wheatstone in the council, remember him as a somewhat shy and retiring man, of sensitive nervous temperament, might probably be apt to forget that this unobtrusive gentleman had a principal share in two of the greatest discoveries of the age: the electric telegraph, certainly, in practical importance, the greatest discovery of the age; and the stereoscope, in a purely scientific point of view, not less interesting. The *Times* has some good remarks on the history of the latter discovery. It says:—

"The resemblance between the waves of light and those of sound seems very early to have attracted Wheatstone's attention; and in 1838 he communicated to the Royal Society and to the British Association an account of some remarkable and hitherto unobserved phenomena of binocu-

lar vision, and a description of the stereoscope, an instrument for illustrating these phenomena. As a matter of pure science, apart from its practical value, this was undoubtedly Wheatstone's best work. The original conception that the notion of solidity is due to the mental union of the two dissimilar perspectives undoubtedly belongs to him, and Sir David Brewster, at several successive meetings of the British Association, spoke of this as the greatest discovery ever made in binocular vision. Wheatstone verified his discovery, not only by the original reflecting stereoscope, but also by a refracting stereoscope made with prisms, to which convex lenses were afterwards added to enlarge the pictures. Brewster did nothing more than suggest the substitution of two semi-lenses turned back to back, which are practically the same as prisms, and can be made much more cheaply; and Duboscq, taking advantage of this suggestion, produced the form of stereoscope now in universal use, and popularized it by the application of photography. This stereoscope was shown at the Great Exhibition of 1851; and the general public then for the first time heard of the instrument; although Dr. Carpenter (and possibly others also) had for some years previously exhibited the relief obtained by a combination of dissimilar photographs to the students attending his lectures on physiology. In 1851, and subsequently, an attempt was made to claim the chief credit of the invention of the stereoscope for Brewster, on the double ground that he had rescued from oblivion a contrivance which would otherwise have been forgotten, and that the principle itself was not new. This latter contention had, however, been sufficiently disposed of by Brewster himself, who, writing in "Lardner's Cyclopædia" before Wheatstone's first paper had appeared, spoke of the dissimilarity of the two perspectives as a difficulty to be overcome.

In 1852 Wheatstone presented a second memoir on binocular vision to the Royal Society, in which he described the results obtained by a new instrument, the pseudoscope, by which exactly the same effect is produced upon the images received by the two eyes from an actual object as would be produced in the stereoscope by the reversal of its pictures; the image projected upon either eye being that which would naturally be formed by the other. By this contrivance he was able to prove, what he had previously maintained, that the stereoscopic result is the effect of a mental process, not of the merely optical relations of the two pictures, for in the pseudoscope, which makes convex objects appear concave, and *vice versa*, we have optical inversions which the mind will not accept. An interesting article on the subject appeared in the *Edinburgh Review* for October, 1858, and from this we extract the following passage:—

When an observer looks with the pseudoscope at the interior of a cup or basin, he not unfrequently sees it at first in its real form; but by prolonging his gaze he will perceive the conversion within a few minutes; and it is curious that, while this seems to take place quite suddenly with some individuals, as if the basin were flexible, and were suddenly turned inside out, it occurs more gradually with others, the concavity slowly giving place to flatness, and the flatness progressively rising into convexity. Not unfrequently, after the conversion has taken place, the natural aspect of the object intrudes itself, sometimes suddenly, sometimes gradually, and for a longer or shorter interval, when the converse will again succeed it—as if the new visual impression could not at once counteract the previous results of recent experience. At last, however, the mind seems to accept the conversion without further hesitation; and, after this process has once been completely gone through, the observer, on recurring to the same object, will not find it possible to see it in any other than its converted form, unless the interval should be long enough to have allowed him to forget its aspect. Vagaries, however, sometimes occur in these experiments of which it is difficult to give any certain explanation, but which would be probably found referable to the same general principle, if we were acquainted with all the conditions of its operation. It would seem as if, in cases of this kind, time became an element, by allowing a reiteration of the new impressions upon the nervous organization, so that they at last become sufficiently

powerful to overbear those which have been left there by previous habits of action; and when these latter have once been overcome, they seem, like an army dispirited by failure, to be put to the rout by a mere alarm in future.

In the second memoir the idea of the mental character of the results of binocular vision was still further supported by experimental evidence, how completely the appreciation of size is governed by other conditions than the size of the visual pictures. In fact, the whole of these investigations were experiments upon mental states, and, when thus regarded, they had even a higher interest than that which arose from their great value as contributions to the science of physiological optics.

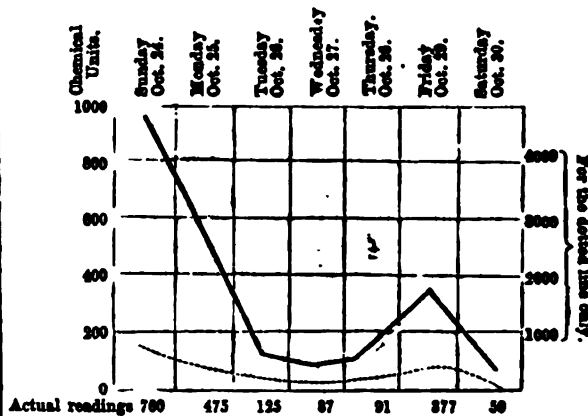
METEOROLOGICAL REPORT OF THE DIURNAL VARIATIONS IN THE AGGREGATE DAYLIGHT OF THE SOUTHERN SKY FROM OBSERVATIONS MADE AT BLACKPOOL.

BY D. WINSTANLEY, F.R.A.S.

THE past week has been so very dark, that I have found it impossible to make an adequate diagram on the scale I have hitherto adopted; I have accordingly utilized the space previously given to 5,000 units for 1,000 only. In order that the comparison may, as far as possible, be carried out continuously, I have drawn, as well as I am able, a dotted line upon the same scale as that hitherto employed.

The aggregate of light during the entire week has only reached the very small amount of 1,974 units, giving a daily average of 282 units only. My former darkest day has already been surpassed, and my darkest week has been outdone in darkness.

The regular decadence of the line in my diagram-book, and its regular rise during the period of seven days ending October 29th (I can draw a circular curve right through each of the seven indices), indicates the regular operation of some definite and precise law of clearance and obscuration; a law which may be of considerable importance to the science of meteorology, and which it will certainly be a matter of absorbing interest to hunt down to its source; whilst the similarity of the present diagram (on the enlarged scale) to that of the seven days ending September 25th indicates the probable operation of the same law at a time when the arbitrary scale of representation seemed to show a merely capricious variation. The whole matter is one worthy, in my opinion, of the most studious investigation. The day is inevitably dawning when prolonged weather casts will have become an accomplished fact.



BLISTERS IN ALBUMENIZED PAPER PRINTS; THEIR CAUSE AND REMEDY.

BY SELING BOTTONE.

NOTHING, perhaps, is so aggravating to the photographer (be he professional or amateur) as the appearance of blister

on the surface of his prints, just at the last stage of the operations. His negative may have been excellent, his light good, his paper apparently of most satisfactory description, the toning has proceeded well, and he is just on the point of congratulating himself on having turned out a batch of richly toned prints with beautiful whites, when, lo! on plunging into the water for washing away the hypo (or very soon after) he is disgusted to find his pictures break out into eruptions, some of which grow to a large size, while others remain comparatively small. If he has not done so before, he refers to all the photographic books he possesses in order to seek a remedy for the evil; and he then learns that little or nothing can be done to cure blisters which have already appeared. However, he meets with various recipes to prevent the formation of blisters, such as, for instance, the addition of alum to the silver bath, the maintenance of the bath strong, while the hypo is kept weak, &c. He consoles himself, therefore, with the hope that by following one or other of these directions he will be able to overcome this new "plague of spots." Having made the requisite alterations in his formulae, he again proceeds to print, and probably turns out a batch quite as blistered as the first. He then frequently lays the blame on the paper, and consequently procures a fresh sample, which, in all probability, will give just about the same results as his former stock. The final result is, that he gives up all hope of being able to prevent entirely the formation of blisters; but he notices, much to his surprise, that sometimes (although circumstances have apparently not changed in the least) the prints will be perfectly free from blisters, while at others, no matter what paper he may use, he will have a plentiful crop of these very unwelcome pustules.

I am not aware that any one has yet found a trustworthy method of preventing these pests, and therefore, if I repeat anything already suggested, my readers will kindly set it down to my ignorance of the fact, and not to a desire to deck myself with feathers belonging to others.

While mounting some *coniferæ* in fluid cells, for the microscope, last winter, I, like many others, was much troubled with the difficulty of getting the delicate tissues to retain their natural forms when immersed in the preservative fluids used in the cells. The change of form which takes place varies according to the nature of the preservative fluid used; but a general result is, that the tissues swell up and burst. On reference to works specially treating on microscopic mounting, I learned that this effect is due in some cases to exosmosis, and in others to endosmosis, and that the only way to avoid it is to employ a fluid which shall have as nearly as possible the same density as the fluid in the cells, and which shall gradually, by evaporation or otherwise, acquire the desired density. In fact, I found this to be perfectly correct; and, acting on this principle, I succeeded in mounting several delicate *algæ*, such as *Batrachospermum Moniliforme*, *Volvox Globator*, &c.

It immediately struck me that *osmosis* lay at the bottom of the "blisters plague" in albumenized prints, and the result of a series of experiments I have undertaken this summer has proved that my conviction was grounded on fact.

Without dragging my readers through a detailed account of all my experiments, I will at once give them a process which will enable them to produce at will prints entirely free from blisters. Sensitize, print, and tone exactly as usual; but, before fixing, take the specific gravity of your hypo bath. Now take a sufficient quantity of water to cover abundantly the whole batch of pictures you have fixed, and which you desire to work, and dissolve in it as much common salt as will bring it up to the same specific gravity as your hypo bath. Place the fixed prints therein, and stand the containing vessel in a sink or other convenient place. Now run a very fine stream of water into the briny solution, so that its specific gravity shall be lowered very gradually only. When all the salt

taste has disappeared, wash as usual in plain water. No blisters ever have appeared with this treatment in any of my pictures, no matter what paper I may have used.

It may be of interest to some to know that small blisters will entirely disappear if the prints be pressed until surface dry between two cloths, and then rolled with a hard cylindrical roller; the large ones, also, may be sometimes coaxed away by pricking the back of the paper behind them with a fine needle, and then rolling.

PHOTOGRAPHY IN PARIS.

(From a German point of view.)

THE well-known Berlin portraitist, M. Schaarwächter, who was chosen as one of the jury at the recent Brussels Exhibition, has just returned from a visit to Paris, and gives an interesting account of the studios in that city, and of photographic matters in general.

He begins by stating that carbon photography has certainly taken a mighty step of progress during the last year or two, and that it has been adopted by the Brussels firm Gernezet Frères, who turn out all their *carte-de-visite* work by this method, printing three hundred to four hundred pictures a day; and the public have now begun to understand that carbon prints are the more valuable, and demand them. In Paris, on the Boulevards, the greatest stir is made by MM. Bugnet et Leymerie, who exhibit a gigantic show-case of spirit photographs; for, notwithstanding the action of the police against the spirit photographers, and the punishing of them by imprisonment, the trade in these productions prospers as much as ever. The proprietors of the establishment must be doing a splendid business, since the charge made for these supernatural productions is very high, the spirits declining to assist in the business unless paid a heavy fee; twenty-five to seventy francs is the charge made per dozen for spirit photographs.

Reutlinger's and Disderi's studios are upon the Boulevard Montmartre, almost opposite each other. The Reutlinger establishment is five storeys high, and is but small. His pictures are well known, and his enlargements very fine. The Disderi studio is little visited just now.

The magnificent glass stereoscopic slides of Lachenal, Faure, and Co. attract much attention. The firm can only work, it appears, in the Paris streets on Sunday mornings, as the traffic on week-days interferes with the taking of pictures. This firm lays great stress on the employment of a very pure white glass for their transparencies, and it is only one house, it appears, that can supply this of proper quality.

The fashionable photographers of Paris are MM. Valery and Liebert, who live opposite one another. Valery's show-case is of marble, and cost, it is said, five thousand francs. The pictures of both these gentlemen are, the writer thinks, inferior to the productions of good Berlin photographers, a verdict in which the French themselves concur, as they admit that they cannot get their negatives so finely retouched in Paris as in Germany. How far this is true need not be said. Valery has four studios, which are almost always full of visitors. The reception rooms are in the highest degree luxurious, as is likewise the case with the Liebert establishment.

Nadar's establishment is but little visited just now, apparently. In the reception room is to be seen a gigantic oil painting, which represents Nadar in the car of a balloon. His activity as an aeronaut at the time of the Paris siege is well known.

The renowned studio of Adam-Salomon is in the vicinity of the Bois de Boulogne. M. Salomon, it is well known, is a sculptor as well as a photographer. The present studio, instead of being low, is, on the contrary, very lofty. It has windows on the south side. As an important piece of the studio, may be mentioned the cylindrical, glaring yellow painted background, a description of which has already

appeared in print. Salomon makes it a rule never to take more than four plates every day, but his present results do not seem to show such high qualities as his former works. It is well known that the striking effects of his pictures is obtained in the manner of printing adopted, and his plates have nothing extraordinary about them.

M. Scharwichter visited the *Imprimerie National*, where he found the Woodbury process in operation, a photo-printing press being employed in that establishment for the production of facsimiles of old coins. This method is also in operation at Goupil's. At the establishment of the latter, who sells nothing but mounted photographs, there are a number of presses now at work. Silver printing is employed by Goupil only to a very limited degree, and by far the larger quantities of prints are produced by means of Woodburytype and photo-engraving. Ten Woodbury presses are in general use, the whole of which are worked by two men, and four steam presses are employed for the photo-engraving. One copper plate yields as many as 20,000 prints.

A somewhat singular advertisement is employed in the Paris streets by M. Maury, one of the Parisian photographers. It is a little equipage with a black man as coachman, drawn by four little ponies, the whole of the carriage being covered with portraits.

Franck de Villecholle's establishment is worthy of note for the production of fine enlargements in permanent pigments. He employs the Sawyer method (the Autotype process), and is able to produce by its means plates thirty-four inches in length. The enlargements are produced by aid of a carbon diapositive.

Correspondence.

PHOTOGRAPHY IN DEVONSHIRE.

DEAR SIR,—I have spent the greater part of the past summer in the South of Devon. The season has been, as regards weather, of an extraordinary character. For two days in the month of June a fire was requisite; then came excessive heats, during which the heated air poured into my room through the open window like gas direct from the retorts of a gas works, being every now and then interspersed with violent storms of thunder and lightning and heavy rain, altogether making out-door practice anything but agreeable.

According to my usual custom, I have made some enquiries for the purpose of obtaining information about the progress of photography generally. The report is by no means cheering. Establishments long flourishing are in many cases *non est*. Watering places seem to be overrun with professionals, but the demand appears to be greatly on the decrease; this may be somewhat attributable to the prices of the necessities of life. More than one railway accident occurred near my residence, and in one instance I observed a female photographer busily engaged in taking a picture of a damaged bridge, and the remains of an engine which a gang of workmen were engaged in removing. You will, I am sure, agree with me that it must have been a firm-minded woman to execute such a purpose, undaunted by the confusion and danger concurrent with such a catastrophe.

There is no lack of the picturesque in all parts of this beautiful county, and of so varied a character that no photographer need despair of finding subjects suited to his taste. I wrote an article in continuation of the guide, which I find did not reach you, and is at present useless, as the season is closed, and indoor amusements are now beginning to be thought of.

I was much gratified to notice in the *News*, some time since, the idea of using a vapour lamp requiring no wick, in aid of the oxy-calcium light, thus reducing the impediments of the magic lantern by one-half, increasing the brilliancy of the light, and doing away with its greatest drawback, which is the formation of scorias on the wick of the spirit lamp. I should think this experiment

might be tried by using what is called a sponge lamp (obtainable for a few pence) in place of the spirit lamp. The stream of oxygen should not be thrown out with too much force: a bent nozzle could easily be fitted to the lamp if required, and render it more safe in use.—I am, dear sir, yours truly,

JAMES MARTIN.

5, Clarendon Place, Ilfracombe, Oct. 19th.

WARMING THE DARK ROOM.

SIR,—Allow me to call the attention of the profession to a petroleum stove for regulating the heat of the dark-room. I have one, and can recommend the same. Having raised the temperature of my operating room 20° Fah. in a little more than half an hour, I keep the temperature at 70°, at a cost of about twopence per day. Amongst many other advantages which are possessed by this stove, are the following:—It is free from dust, can be lighted at any time, and the heat can be regulated to a nicety. The first cost of the stove is only twenty-four shillings. The manufacturers of that I am using are Messrs Wright and Butler, of Birmingham.

I feel sure this little apparatus will be a great boon to many who are at a loss for a means of effectually heating their dark-rooms.—I am, sir, yours, &c., J. D. HANNAH.

Islington, Shrewsbury, October 2nd.

[A small "greenhouse stove," burning rock-oil, is kept by many lamp manufacturers, which will probably answer a similar purpose.—Ed.]

WORKING PHOTO-COLLOGRAPHY.

SIR,—With reference to your correspondent "W. R. P." and the difficulties he has met with in photo collography, I must sympathise, and, therefore, throw in a word or two of encouragement.

To commence, he must banish the idea that the mechanical processes are simple, and require little time and attention to ensure success, for that is erroneous; in fact, nothing, in my experience in photography, demands more patience and perseverance, and requires more of that indomitable "go ahead" which is the surest means of overcoming failure, than the mechanical process; but, without failure, success would lose half its value; consequently, a person starting these processes should not hear of such a word as "fail," or even be disheartened, but try again and again, till the hand in rolling, which is simply manipulation, and the eye, which means observation, are thoroughly educated; in fact, the roller should, in producing or reproducing a print, be to the worker what the brush is to the artist, as both are the means used to impart the colour to the resulting print, artistically and well, or *vice-versa*.

"W. R. P." states that he has tried twice and failed, then gives it up and asks queries, to which I reply. 1st. Nelson's gelatine is thoroughly suitable. The exposure, in my opinion, was too short, and the printing on the back of the plate too much. To eliminate the bichromate, place the plate in a bath or dish for half an hour, changing the water six times. The effect of the bichromate being allowed to remain in the skin would be, that when dry the chromated gelatine would simply be sensitive to light. Having thus answered the queries, may I kindly suggest that "W. R. P." will take a good half-tone view, expose in a good light till it receives twelve tints, then sun the back of the plate till one and a-half tint is observed, carefully roll with ink of a proper consistency, mixed well with "don't-fail," and there will be little fear of a repetition of his first results.

W. B. D.

WAXING PLATES FOR DEVELOPING CARBON PRINTS.

DEAR SIR,—Will you allow me to point out to Mr. Lambert's licensees, and to all others who develop carbon prints on glass, that the nuisance of having to rub the glass with a waxing compound, then polishing, &c., with a result

by no means certain, may be easily avoided by using a solution, and proceeding as follows:—Make a mixture of methylated ether twenty ounces, beeswax sixty grains; scrape the beeswax to assist its solution, let it remain a day or two, occasionally shaking the mixture; then allow it to settle, and pour off the supernatant liquid; to five parts of benzoline add one part of this clear fluid, and it is ready for use. Coat the plate as with collodion. It will dry in two or three minutes, and can then be coated with the collodion. Pictures developed on plates so prepared never fail to strip most perfectly.

This solution can be had from my firm if photographers do not choose to prepare it themselves.—I am, yours truly,
Autotype Works, Ealing Dene. J. R. SAWYER.

Proceedings of Societies.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE ordinary meeting of this Society was held on Monday evening, the 4th instant, at the Victoria Hotel, Bradford,—the President, Mr. J. W. GOUGH, in the chair. In consequence of the intimation in the circular that M. Lambert would be present (by invitation) to exhibit specimens of his processes, there was a very numerous attendance of members.

The minutes of the previous meeting having been read and confirmed, the Secretary read the minutes of a meeting of the Council held on the 17th ult., at which it was resolved that the annual dinner of the Society should be held on the 17th November, and that the members be invited to each contribute a few of their productions for the inspection of the members. After some conversation,

Mr. SMITH proposed that the members should be at liberty to introduce a friend, either lady or gentleman.

More discussion followed, and it was finally resolved to leave the matter in the hands of the Council to make all necessary arrangements.

The CHAIRMAN then introduced M. Lambert to the members of the Society, who exhibited a large number of pictures by the Lambertype and chromotype processes, and several reproductions of negatives produced by the contotype process.

The pictures were examined with marked interest by the members, who listened in a very critical manner to M. Lambert's explanation of the method of production and the various peculiarities of the processes. The majority of the members expressed their entire satisfaction with the specimens exhibited, the general opinion being that they were the finest specimens of enlarged work the members had ever inspected—the examples in which the backgrounds had been changed, dresses altered, and light and shade modified, being particularly commended.

Mr. SMITH (Halifax) proposed that the best thanks of the Society be presented to M. Lambert for his kindness in giving the members an opportunity of inspecting his numerous and splendid productions. He (Mr. Smith) said he looked upon them as triumphs of photographic art, and he did not remember ever meeting with anything of the kind from which he had derived so much pleasure as from the inspection of M. Lambert's reproductions.

Mr. SACHS seconded the resolution.

The CHAIRMAN, in supporting the motion, said the beauty of the results was beyond question. The progress in developing large work made our art a more monumental one, and the specimens exhibited were eminently works of this kind. If M. Lambert could teach them to produce such work as that before them in five or six hours, he would assuredly earn the title of a true benefactor, for few of them, he thought, had accomplished as much in as many years.

Mr. W. E. BATHO, in further support of the resolution, said that whatever the views he held personally regarding M. Lambert's patent, he was happy to add his testimony to the skill and ability displayed in the exquisite productions which had been that evening laid before the Society. Some of them he thought had never been surpassed. He believed the methods employed were of great use in the hands of a man of ability, and were capable of yielding results very much above the average.

The resolution was then put to the meeting, and carried.

Mr. ILLINWORTH, having exhibited several chromotypes, said himself as being amply satisfied with the processes, and added the sum he had paid for instruction and the right to use was well-spent money.

Mr. WORMALD, after complimenting M. Lambert on the excellent pictures exhibited by him, said it made photographers long for the day when all their work would be executed in permanent pigments, and silver printing be entirely discarded.

Mr. GREAVES (Halifax) laid on the table a number of cartes printed in carbon by a method of his own, and invited criticism. The pictures were much admired by all present.

M. LAMBERT said they were the finest carbon prints he had ever seen, and complimented Mr. Greaves on being the most successful carbon manipulator he had met with; but he considered them inferior to chromotypes in gradation, the whites not being so pure. He explained that it was a peculiarity of the old method of manipulating.

Some small carbon prints by Mr. Taylor, of the Autotype Company, were handed round by Mr. Illingworth, but were considered as very inferior to both the chromotypes and the specimens exhibited by Mr. Greaves.

After a somewhat lengthy discussion, in which several members took part, a vote of thanks was passed to Mr. Greaves for the pictures he had exhibited.

Mr. GREAVES, in responding, promised to take an early opportunity of reading a paper on his method of carbon printing.

Mr. BURROW (Bradford) handed round several very fine 12×10 negatives produced by the Liverpool Dry Plate Company's emulsion, and said that he had secured by its use some of the finest negatives he possessed.

After some further conversation, the meeting was adjourned.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this Association was held on Tuesday evening, the 26th ult., at the Free Library, William Brown Street, the Vice-President, Mr. W. ATKINS, occupying the chair.

The minutes of the previous meeting were read and passed.

It was proposed by Mr. W. H. KIRKBY, and carried, "That each member shall be expected to present yearly to the Society's album at least one photograph. The photographs to be submitted to the Council, who may reject any they do not think worthy of a place there."

Some diagrams, illustrating the diurnal variations in the aggregate chemical force of the daylight of the southern sky, prepared by Mr. D. Winstanley, of Blackpool, were passed round for inspection.

In reference to the preparing of gelatino-emulsion plates, the Rev. H. J. PALMER recommended the members to follow the instructions given in an article on "Winter Employment for Amateurs," which appeared in *The British Journal*.

Some exceedingly fine views of Scottish scenery kindly lent by Mr. W. Harding Warner, then engaged the attention of the members, and afterwards the meeting relapsed into conversation, adjourning until November, when the annual meeting will take place.

Talk in the Studio.

THE PHOTOGRAPHIC EXHIBITION.—The photographic exhibition will close a few days earlier than was originally contemplated. The last day will be Friday, November 19th, when the exhibition will finally close at four o'clock.

PHOTOGRAPHIC SOCIETY SOIREE.—Instead of the usual meeting of the Society the session will open on November 9th with a *soiree*, to be held in the Exhibition Room in Pall Mall.

LANDSCAPES AT THE EXHIBITION.—In our notice of the photographic exhibition last week, the pretty little examples of landscape photography exhibited by Mr. H. Mansfield were by a printer's error attributed to H. Mousfield.

PHOTOGRAPHY DOWN WEST.—Here is an old story, familiar to most of our readers, which, after floating about for years in various journals, has just been promoted to a place in the leading daily journal, having appeared a few days ago in the *Times*:—"An American paper states that a Nevada photographer takes very decided measures for turning out a good picture. A sitter being in his place, the artist produced a navy revolver, cocked it, levelled it at the sitter's head, and said, 'Now just you sit perfectly still, and don't move a hair; put on a calm, pleasant expression of countenance, and look right into the muzzle of this revolver, or I'll blow the top of your head off. My reputation as an artist is at stake, and I don't want no nonsense about this picture.'"

ARTS APPLICATION OF PHOTOGRAPHY.—Photography has various useful applications recently in the Arctic Expedition. In the record of Captain Young's voyage in the *Pandora*, returned, we find the statement: "We visited the graves containing graves of three of Franklin's men and two of the *Star*, and found the wooden head-boards well preserved." Our artist, Mr. de Wylda, made a number of photographs and photographs of the place." And again: "We were the little *Por*, lying at anchor in Toigtut Bay. I saw the little *Por* had her photographed. It seemed a lucky chance to meet the little *Por*." In a recent visit of the *Marine* and *Chaparral* of London to Epping Forest, Mr. Young made the same remarks by saying:—"He had now come passing duty to perform, for he had been asked by his colleagues on the committee to request the acceptance by the *Marine* of a small gift as a souvenir in the shape of an artistic photographic views of the most beautiful scenery of Epping Forest."

THE INVENTION OF MARS.—The *English Mechanic* says: "It will be remembered that during the siege of Paris a great deal was done in the sending of photographically reduced dispatches by balloons. The inventor of the method of reduction, M. Dagron, has lately applied it to the production of maps. In this way the whole official map of France is brought into a form that can be easily carried in a pocket-book; and maps of all the countries of Europe are arranged to be carried on a cartridge belt, along with the magnifying apparatus (télégraphe microscopique, a joint invention of Dagron, Dallmeyer, and Hübner). The reduction of the maps can be on any required scale; the smaller this is, the more convenient the magnification. The telegraph has the size and form of a stereoscopic apparatus. By means of it all the details of the original map are greatly enlarged, and can be easily studied. In darkness, the light of a match, or even the glowing of a cigar, will be sufficient to read off the map at once. The French authorities these maps will prove very serviceable in case of war, as also for educational purposes."

Our Correspondents.

- C. E. F. As a means of securing absolute immunity from cockling, India rubber possesses many advantages as a mounting material for securing photographs in albums; but it is apt, in the course of years, to change to a friable, dark-coloured resin, inelastic and unattractive, and in course of the change it often injures the prints. Glin, used with as little water as possible, answers. A material sold under various names, really consisting of glue dissolved in alcohol and water, answers well. Marlon and Co. sell such a material. It is a good plan, in mounting prints in albums, only to apply the adhesive material to the edges of the prints.
- H. M. M. The green colour of the gold solution is due to the presence of copper, which had, doubtless, been used to alloy the gold you used. By adding carbonate of soda, a little at a time, the copper will be thrown down as a carbonate. Take care to avoid adding too much soda salt, and, after the copper is thrown down and filtered out, add a little hydrochloric acid to neutralize any excess of soda, and leave the gold solution in a very slightly acid state. Or you may throw down all the gold again with a solution of sulphate of iron. This will precipitate the gold as a black powder. Wash it well to remove all traces of the iron, and to dissolve the gold in aqua regia, which will give you very pure chloride of gold.
- A. M. M. The practice of assuming evening dress prevails at the meetings of all the learned societies, and we do not see that there is legitimate ground of complaint that at a regularly appointed society a general custom should be maintained. The opening night of the exhibition was a different matter. A custom had prevailed for years of opening the exhibition with an informal reunion of the members and their friends. Such a meeting had always been successful and pleasant, and the plan of superseding this friendly meeting by a ceremonious soiree, at which the wearing of evening dress was prescribed, debarred many members of the Society, as well as their friends, from being present; and it was, in many respects, unwise, if not unfair.
- G. H. H.—The only practical work on carbon printing which you can procure is the manual published by the Autotype Company. The practical and historical work we wrote a few years ago is now out of print. A little work on carbon printing issued a year ago by Mr. Blair was chiefly descriptive of his own experimental processes. The numbers of the *Photographic News* for November and December 1873, except December in print.

J. T. T. asks where powdered talc can be obtained, and at about what cost. Can any of our readers supply the information? Unless it can be easily procured, probably the best plan would be to procure pieces of waste talc, and pound in a mortar.

C. R.—We shall have pleasure in seeing the prints. The tone of that enclosed is good, the black being rich and warm.

F. M. D. SMITH.—As there are five varied modes of intensifying under the heading to which you refer, we cannot tell which of them you have been using. You must bear in mind that any of the methods of intensifying which depend on the piling-up of silver are not well suited for intensifying negatives of fine engravings containing delicate lines, as the piled-up metallic deposit is apt to fill up lines and produce coarseness. Any of the processes which depend on colour are best. The use of Schlippe's salt gives an intense scarlet negative. The use of the Sello's intensifier gives a very non-actinic brown negative. The last-mentioned method, under the heading you mention in the *Year-Book* for 1868, is good. We refer to the application of a five-grain mercury solution, followed by a one-grain iodide solution, and this followed by a dilute solution of hydrosulphate of ammonia. This gives an intense negative without much piling-up.

T. J. DIXON.—You do not state by what process you wish to produce lantern transparencies. They can be produced either by the wet process, or on dry plates. With what process are you most familiar? We have published instructions repeatedly, both in the *News* and in our *Year-Books*, for producing transparencies both by dry and wet processes. Any of the methods would require too much space to be described in this column; but if you want full details, we can probably refer you to some article. As a rule, gold toning gives the most satisfactory effects; although a fine warm black tone can be secured by the application of a five-grain solution of bichloride of mercury, followed by a weak solution of sulphide of ammonium or sulphide of potassium.

GEORGE FOARD.—The possession of a complete equipment of material and appliances, together with a sight of the working of the process, will enable you to work the carbon process, or Autotype process as the company style it; but, so far as we know the mode of enlarging employed at Ealing by the company, forms no part of the demonstration, which is confined, we believe, to carbon printing. 2. Carbon printing can be applied to cabinets and others small work. 3. So far as we have seen the "Chromotype" method, it is a valuable aid to carbon printing. As you might see stated recently in our columns, Mr. Hughes has abandoned silver printing for all kinds of work, and adopted this method in its stead. We cannot give you any precise instructions on the subject of cost.

J. W.—Success in photo-collographic printing depends really upon a great many small things, which can be only gained by slow steps, piling up experience upon experience. A sight of the operations of a successful worker is of immense value. But it must ever be borne in mind that the process requires at least as much skill as lithographic printing, and that is a business to which it is usually required to serve an apprenticeship. Skilful amateurs in such work may, it is true, succeed by perseverance without apprenticeship, but it is only skill and perseverance which can hope so to succeed. Regarding the inking-up, which, as you rightly understand, is a point of vital importance, you scarcely do wisely to attempt the work with an ordinary printer's roller of glue and treacle composition. Such a roller may be used in experienced hands for collographic work, but there is very great risk of its adhering to the gelatine film and tearing it up. An India-rubber is best suited for the work.

B. L. F.—The term Ambrotype was used in America to indicate the old glass positive, which is now all but obsolete. It is occasionally used still, we believe, by the peripatetic photographer who frequents races, fairs, and other public places; but these now chiefly use the ferrotype plates, which of course possess many advantages over glass. A good developer for these positives consists of twenty grains of protosulphate of iron, twenty minims of acetic acid, and two minims of nitric acid in an ounce of water, with alcohol, if necessary, sufficient to make it flow freely. Either a benzole varnish or a spirit varnish may be used.

F. S.—As we have repeatedly stated, we do not approve of long soaking as an aid to perfect washing. Rapid changes, with draining of each individual print between each change, or subjection to heavy pressure, will be found a more effective mode of getting rid of hypo than any amount of long soaking.

R. J. T.—With the exception of carbon enlargement, we think the collodion transfer is the most satisfactory mode of securing a permanent enlarged image on canvas for painting. We have repeatedly described the method in the *News* and *Year-Book*. There is considerable direct on the canvas, as it perfect washing.

The name was an
Mansfield.

dependents in our

the *News* and *Year-Book*
being a silver print
re perfect fixation

it should have

*The Photographic News, November 12, 1875.***PHOTOGRAPHY IN AND OUT OF THE STUDIO.—A NEW APPLICATION OF GUNCOTTON—HOW TO PREPARE ORANGE-CHROME—COLOURING METALS BY MEANS OF HYPOSULPHITE OF SODA.**

On a new application of guncotton.—Photographers are so much interested in guncotton and its applications that they will be pleased to learn something of a very important use to which the valuable agent has recently been put in warfare. That pyroxyline has, of late years, become a most formidable military agent is well known to most of our readers, and, since the improvements made by the Austrian and British governments, it has to-day in many instances superseded gunpowder, which for the past half-dozen centuries alone played the role of explosive in military and naval matters. For torpedoes and military mines, as also for blasting and other industrial purposes, guncotton, which gives the surgeon and photographer their colloid, has been adopted very extensively; and although "soluble" and "explosive" pyroxyline is slightly different in composition, still there cannot be a doubt that the wider the manufacture of the material spreads, the more cheaply may the photographer hope to obtain his supply of guncotton. Some months ago, our readers may remember, experiments were made to ascertain the velocity with which gun-cotton detonates, and, to make trial of the matter, a line of gun-cotton cakes or slabs was constructed, about forty or fifty feet in length. By detonating the first of these cakes, the whole line, one after the other, was consumed with a terrible noise; and the time taken for the detonation to travel from the first cake to the last was calculated by means of Capt. Noble's chronograph. It was then found that the rapidity with which guncotton detonates, or the detonation travels, is greater than that brought about by any other agent, with the exception of light and electricity. The rate at which the electric spark travels is a little uncertain, but Wheatstone gives it at 200,000 miles per second; the detonation of guncotton cannot, of course, be compared with this, but it is far superior to the speed of any material agent. Thus, the velocity of a cannon ball at the time of its highest speed, is only about 13,000 to 16,000 feet per second, and the transmission of sound is scarcely as rapid, being about 11,000 feet per second. Gun-cotton detonates with a speed equal to three miles or three miles and a quarter per second, and it is this very rapid explosive property which has led to its utilization in the so-called water-shell. Of this water-shell, whose doings at Okehampton last summer attracted so much attention, a good deal has been written in the contemporary press, but in many cases its properties have been entirely misunderstood. It has been described as an incendiary or fire-shell, as if it vomited flames and smoke on bursting, whereas the truth is that there is an entire absence of any visible combustion, and the terrible missile bursts into fragments without emitting even a spark or a flash. There is no time for fire, the breaking up of the shell is so instantaneous. There used to be an old lecture experiment, doubtless familiar to our readers, which consisted in putting a few grains of gunpowder in the palm of the hand, and above them a little tuft of gun-cotton; the latter was then ignited with a spark or flame, and disappeared so rapidly that the gunpowder had not time to burn. In the case we talk of, the pyroxyline detonates more rapidly still. The water-shell—which may be termed the latest "infernal machine," notwithstanding its inoffensive name—will, in future, be an important consideration in artillery practice, and it will be one of the most terrible weapons yet devised. It is an ordinary shell, or hollow casting of iron, nearly filled with water, and into it is put through the fuse-hole a little waterproof bag containing not more than an ounce or two of gun-cotton, and a fulminate fuse. Water is known to be one of the most incompressible of substances, and,

therefore, transmits the detonation of the gun-cotton, when this takes place, very rapidly and completely. For this reason, when the small charge does take effect, the explosive force is taken up with all its velocity by the water, and the walls of the shell being acted upon uniformly and instantly at every point, the iron shivers into the smallest fragments, and scatters destruction in every direction. Gunpowder explodes so leisurely in comparison, that the shell gives way in its weak parts, and breaks up into a score of pieces only, while with gun-cotton the detonation is so rapid that it is communicated at the same time to every portion of the casting, and the latter is almost pulverised, the number of fragments being infinitesimal. In this way it is that the last discovered property of gun-cotton has been made use of.

How to prepare orange-chrome.—Chrome-yellow, or chrome-orange, such as photographers employ in their dark rooms, can be easily prepared, according to the *Polytechnisches Journal*, and, where any quantities of such compounds are required, it would pay the photographer to make it for himself. The pigments may be either applied to glass, or, better still, used for staining paper, which would be useful in screening light or packing dry plates. Ten parts by weight of acetate of lead are dissolved in ten parts of hot water, and diluted with ten parts of cold water; then two parts of bichromate of potash are dissolved in ten parts of hot water, and one to two parts of sulphuric acid are added, together with ten parts more of water. On cooling, these two solutions are gradually mixed, briskly stirring the while. A beautiful light yellow precipitate is in this way formed, the tint of which is deepened by the addition of chloride of zinc or chloride of calcium. The liquid part is decanted off, and replaced by fresh water. To prepare a yellow of the shade of orange, such as would be of most service to the photographer, and which resists the action of alum and acids, as also heat, two solutions are made, of ten parts of acetate of lead in ten parts of hot water, and 3·8 parts of bichromate of potash in ten parts of hot water, the latter solution having added to it 3·6 parts of crystallized carbonate of soda. The mixture is boiled for half an hour, and its shade may be varied by modifying the ingredients.

Colouring metals by means of hyposulphite of soda.—A novel use of hyposulphite of soda has recently been made in Germany which deserves mention. It is that of colouring metals by its aid, their surface being covered with a thin layer of sulphurous acid solution. In this way objects of brass, or gun-metal, or iron, or zinc, can be coloured to represent gold or copper, or be tinted carmine, chestnut brown, bright aniline blue, pale blue, &c., according to the thickness of the layer and the duration of the action of the solution. The colours, it is said, have a beautiful lustre, and, if the metal objects have first of all been treated with acid and alkali, the tints adhere so firmly as to admit of polishing. Of hyposulphite of soda is taken 42·5 grammes, which is dissolved in 450 grammes of water, and, after the solution has been made, another, consisting of 45·5 grammes of acetate of lead dissolved in 225 grammes of water, is added to it. The mixture is warmed to 90° Fah., and then decomposition ensues, and sulphide of lead is precipitated. The metal object having first been treated with acid or alkali, and warmed, is then put into the mixture, a portion of the sulphide of lead is deposited, and the above-named colours appear according to the thickness of the deposited layer. Instead of acetate of lead, the same amount of sulphuric acid may be put in, and gun-metal introduced into the mixture assumes a fine greenish-red colour. The temperature in this case must, however, be a little higher.

PICTURE-MAKING AND PICTURE-SELLING.*

MANY valuable hints have appeared in your esteemed journal on the subject of picture-making, but till now you have not

Photographische Notizen.

uttered a syllable upon the question of picture-selling. Of what use are the finest pictures to us, if they remain upon our shelves? A bad picture which finds a purchaser is, after all, of more value, for then we can do business, and that is what we all of us want to do.

Some years ago I read a notice somewhere respecting an American photographer—it may have been in these very pages—to this effect:—"This is to give notice that henceforth I shall not sell any cheap pictures. I shall endeavour to produce the best work possible by means of photography, and shall only supply pictures of the very first-class. For this reason, in future, a charge of six dollars for a dozen of cartes-de-visite will be made," &c. This notice struck me very much at the time, and I have often wondered whether many would follow this example. It seemed to me a ticklish experiment to make to charge twelve florins for a dozen cartes. Let he who has courage enough ask such a price, thought I. Recently I hear from a friend, just returned from America, that the photographer in question was not successful, and I was shown some of his pictures. I found out then that he understood how to make pictures, but not to sell them.

Those who wish to ask extraordinary prices must have an extraordinary name. If this has been done, then a picture of very moderate pretensions may be passed off at a high rate. I once paid a visit to my noted colleague, Hanfstängel, the court photographer of Dresden, who has now retired, and who at that time took the first rank in Dresden.* Till then I had not seen any of Hanfstängel's photographs, and I hope that skilful photographer will forgive me when I say that they did not please me so very much when I did behold them for the first time. It seemed to me as if they produced pictures, at any rate, quite as good at Vienna. I was therefore all the more surprised at the prices charged for them. Six thalers (eighteen shillings) for a dozen cartes, for cabarets were not in fashion then, and at a time too when studios grew up like mushrooms, and prices were rapidly going down. I did not stifle my astonishment with my host, who drily remarked, in reply, "I certainly shall not decrease my prices; rather raise them, if anything."

How long the renowned artist was enabled to go on in the same way I know not. There are, at any rate, very few of his colleagues now in the same envious position as he was, and further, there are those who charge but a fifth or sixth of his prices, who still manage to do very good business now-a-days.

The young photographer who establishes himself must be guided by the particular public that he serves. The modest customer requires to be served cheaply, and is satisfied with little. It would be ludicrous for a young photographer having a studio in a poor neighbourhood to finish his clichés with fine and fastidious retouching, and to acquire a stock of handsomely carved furniture, balustrades, couches, balconies, &c. His customers would not even know how to appreciate such fine things. His public would be far more grateful for the loan of a sham gold chain, or a chimneypot hat, during the pose, and such accessories are, indeed, to be found in some studios.

There was a very talented photographer of my acquaintance who was in a position to take pictures of the first quality, but who, by reason of the locality of his studio, failed to obtain customers. He, however, soon began to appreciate his neighbours, and by modifying his prices and making pictures more suited to a humble public, soon began to do a good business. His customers—who were for the most part artisans—came mostly upon Sundays and fête days. On week days he had nothing to do. On Sundays, however, he had sometimes to take fifty portraits, frequently obtaining three pictures on one plate, in which case three persons one after another put their heads into the rest, without the same being in any way altered.

* Hanfstängel has since opened a studio at Berlin, where he still charges his high prices.

Lately, my friend has been compelled to arrange his printing room as a studio, also for Sunday work, to cope with the many customers who visited him; and his charge of two or three florins per dozen pictures pays him, I know, better than others of my colleagues, who demand nine florins, and who are often kept waiting for their money by their grand customers.

When, therefore, people tell us that the photographer should always exert himself to produce pictures artistically beautiful, such advice must only be taken within certain limits. According to my idea, a photographer who has to earn his bread should strive to produce saleable pictures to meet the taste of the public for which he works.

I know a photographer of some standing, as an artist in a university town, who absolutely refused to take a group of students in *neglige* attire, posed in their shirt sleeves, with pipes in their mouths, their saucer-like caps on their heads, with mugs of beer in hand, and a cask in the background. Our artist endeavoured to prove to the students how ugly and how inartistic such a combination would appear; but these simply went away to another photographer who was less scrupulous in the matter of art. The latter is now doing a capital business with university men, taking numberless pictures, which, if they are not beautiful, are, at any rate, well paid for.

Similar cases are to be met with in landscape photography. A renowned photographer, at a fashionable spa, was advised to prepare some pictures of the place for sale. He did so, looking out for the most favourable and artistic points of view about the neighbourhood, and taking a series of pictures in this way; but he declined to photograph some ugly hotels and lodging-houses about the place. As, however, the guests were interested, especially in the buildings in which they lived for some weeks, it was but natural that they should desire pictures of them, and the photographer who subsequently secured representations of the buildings made a very good profit out of the inartistic productions. Indeed, there were far more purchasers to be found for the latter prints than for the artistic landscapes, about which the people were but little interested.

Such instances as these prove, beyond measure, that the selling of photographs is an art which photographers should understand, and quite as well as the making of them.

PRACTICAL NOTES ON VARIOUS SUBJECTS.

BY CHARLES WALDACK.

DIPPING AND FLOWING BATHS—HARDNESS AND SOFTNESS, INTENSITY AND DETAIL—BLISTERS—DEFINITION IN CARBON PRINTS.

Dipping and Flowing Baths.—In Great Britain and in the United States vertical or dipping silver baths are in general use. On the Continent hardly any but horizontal or flowing baths are employed by photographers. An old practitioner with the dipping bath, I have given the flowing bath a trial of several months, and I now intend to give the results of my experience with it. For the benefit of those who may not be acquainted with the *modus operandi* of the Continental photographers in silvering their plates, I will state that the flowing baths generally in use are flat dishes made of porcelain or of glass plates cemented to a wooden frame by means of marine glue or pitch. One end of it—that which stands away from the operator—is covered over to a distance of several inches, so that the dish can be tilted up without spilling the silver solution. To sensitize a plate, the operator tilts the dish with one hand, and with the other lays the collodionized plate at the bottom, then bringing it back to an horizontal position causes the solution to flow over the plate. The plate is now left for two or three minutes until the alcohol has been mixed with the solution, and the practice of photographing is then commenced. The practice of photographing is then commenced. The practice of photographing is then commenced.

about a minute. In this, their practice is different from that of vertical bath workers, for although some of these do sometimes move their plates up or down to insure more rapid sensitizing or freedom from streaks, it is always at a danger of dropping it, and of stirring up the sediment which remains at the bottom of the bath. It is the possibility of rapidly sensitizing a plate that is one of the advantages of the flowing bath, for a rapidly sensitized plate conduces to cleanliness. A solution which in a vertical bath will cause on the plate streaks in the direction of the dip will yield a perfectly clean plate in a flowing bath, when operating as described above; and, what is more, a solution which causes a fog owing to the presence of organic matter—such a fog as can be partly dusted off when the plate is dry—will yield a negative quite free from it if the sensitizing is rapidly done, and the development not pushed to its extreme limits.

Many a photographer in a small way of business, and who cannot always have several spare solutions on hand, is sometimes stuck in a fog from which the use of a flowing bath would relieve him until the proper sunning, or boiling, or tinkering can be gone through. In a large establishment, where gallons of solution can be used, the advantages are all on the side of the vertical bath. A solution of gallons is not apt to change from day to day as is a solution of a pint or a quart, and then the plate requires no handling; it is dipped and withdrawn when ready, always provided the solution is in tip-top condition. In the large baths made of glass plates, such as are used in America (I am not acquainted with dark room practice in England) there is room for several plates at one time, which, where a large business is done, is quite an advantage. There is another advantage of the flowing bath, however, to which I wish to call attention. During the winter the time for working may have arrived before the solution in your vertical bath may have taken the proper temperature, and if this be a large one it is not always convenient to empty it and warm the contents. Now a quart of solution is easily warmed, and this is enough for an horizontal bath of eleven by fourteen size.

Hardness and Softness, Intensity and Detail.—The time is not passed so very long when all of us were striving after intensity. We wanted intense collodion, silver solutions which give intensity; sulphate of iron was not in use because it did not give enough intensity, and pyrogallie acid was the developer. All printing had to be done in the sun on strongly salted paper. This was the period of what a humorous transatlantic friend called cast-iron negatives. Intensity then was the great desideratum, and if we could not get it by regular development, we used to pile on the silver by redeveloping, or produce it with bichloride and iodide of mercury and sulphide of potassium. Our education and the change in our tastes have been slow and gradual. Now softness is what we are striving for. In portrait photography strengthening with sulphide, mercury, &c., and even redeveloping to a great extent, have been abandoned. We want to develop a negative in one operation, so that it yields prints full of detail in lights and shadows, and of sufficient vigour, without chalky whites and inky blacks. And this result is pursued by some photographers with as much zeal, and sometimes as little success, as they did intensity a few years ago. I intend on this point to give the results of my experience, without presuming to tell anything new. The first point to consider is the lighting of the model. If the contrasts in your model are not too strong, if your lights are soft, and your shadows transparent, it will be comparatively easy to produce a negative possessing the required qualities. How to light a sitter is a subject on which a great deal might be written. It is a matter of disposition of studio, position of the sitter in the studio, use of screen and reflectors, &c. But on this we will not enter now. The second point is the collodion. The thicker the collodion, the more intense the negative. My experi-

ence with most of the collodions in the market is that they give too much intensity if used as recommended on the labels. A remedy is to thin with alcohol and ether; but if it possesses good flowing qualities, better not tint with it, but obtain softness and gradation by increasing the quantity of nitric acid in your bath. A silver solution will stand a much larger quantity of acid without loss of sensitiveness than is generally used, principally when a good creamy collodion and an energetic developer are used. I do not recommend to add acid by the ounce, as does Mr. Black, of Boston, although I am not prepared to say that he is not right in his assertions; but I know that ten or fifteen drops C. P. to a quart of solution, or as much less as will produce softness, will work no mischief. Certain collodions will, however, give a film which slips in an acid bath. In such a case use albumenized glass. Intensity is also dependant on the strength of the developer which is used. A thirty-grain developer will give a stronger image than a fifteen-grain one, and this is quite independent of the quantity of acid used as a restrainer (within certain limits, at least). A developer which contains alcohol also gives a weaker image than one which does not. I have for years made negatives for enlarging by the solar camera with the same materials used in ordinary work, simply by adding alcohol freely to the developer. Softness, finally, depends on the exposure in the camera. Under-exposure always gives hard negatives. Over-exposure, on the contrary, reduces contrasts. As an outdoor photographer I have often had to make views of country houses illuminated by a strong midsummer sun, and, by forcing the exposure, have succeeded in producing an effect of light similar to that of the soft, mellow, Indian summer days. An eminent American photographer, with whose mode of working I am familiar, illuminates his subjects with rather strong contrasts, and, by giving a longer exposure, reduces the contrast to the point desired.

Blisters.—As an old photographer who began operations shortly after the discovery of the collodion process, I have necessarily passed through most all accidents and failures that can befall us, and of which the practice of photography in our days, owing to a better understanding of the processes used, is quite free. It happens often that the experience acquired in former times proves a great help in getting over new difficulties which, through the use of new materials, have made their appearance in later times. One of these accidents which make the despair of a great many of our craft is the blistering of the prints in the hypo or in the first washing waters. This blistering was quite unheard of before the use of double or strongly albumenized papers. The mishap which befell me happened at the time when it was found that our printing baths were unnecessarily strong. As generally happens, the reaction against strong baths went beyond what prudence would dictate, so that twenty and twenty-five-grain solutions began to be used instead of the sixty or eighty-grain which were used formerly. We were in the habit then of laying the prints the one on the top of the other on a glass to allow them to drain. One day the prints were allowed to become nearly dry, and were found all stuck together—a thing which had never happened when I used strong solutions. This proves that the weaker the solution the softer and stickier is the surface of albumen. The blistering, in my opinion, is owing to too hard and too horny a surface, and if those who are troubled with it will reduce the strength of their solution, they will find that the accident will immediately disappear. I would, however, only recommend this remedy in case the blistering takes place in the hypo or takes place in the washing in spite of the use of a strong salt solution immediately after the hypo. When a batch of prints has been made on strongly-silvered paper, and the first ones begin to blister, the remaining can be saved by the addition of a small quantity of ammonia, or carbonate of ammonia, to

the fixing bath. The ammonia will take out the size of the paper, and the prints will become transparent, but they will dry up all right. I make these statements with confidence, and I would be glad to have those who try the remedies given to report their experience.

Definition in Carbon Prints.—Carbon printers in these regions have been in despair during the hot summer period. In spite of all they could do, they could get no definition. With the lowering of the temperature the evil disappeared. Can the difficulty be overcome, or have we to remain idle as soon as the dog days arrive; and what are those in warm climates to do? If the failure to obtain sharp prints in hot weather is owing to manipulation, it would be well if those interested pecuniarily in the progress of carbon printing would give us the remedy. There is one kind of tissue, however, which gives sharp prints in spite of the hot weather: that specially made for transparencies. Could not a tissue like this be made of a colour as to be serviceable for prints on paper?

THE FIRST STEPS IN NOCTURNAL PHOTOGRAPHY.*

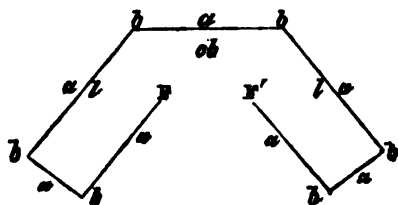
Working with my dry serum collodion, and struck with its great sensibility, I have undertaken a series of experiments for making positives by the means of ordinary artificial light, and I have had the satisfaction to see my experiments succeed beyond my expectation. I now send you a number of prints (with negatives and positives) made by the light of my two kerosene lamps, each one having the value of four candles; I also send you a short and truthful account of the processes by which these negatives and positives were obtained.

This process is rich in practical applications, and can be used in making positives and negatives on glass and paper at night as well as during the day, and can be used in the production of transparent pictures, glass stereos, copies, designs on glass or on paper, of lace and other tissues, copies of ordinary manuscripts and albatypes, plans, maps, &c., &c.

In microscopic photography this process can be used with great advantage, as the destructive action of concentrated heat is avoided.

Our method of operation is quite simple, and requires only an addition to the photographer's outfit, which he can easily make with a few pieces of pasteboard. This consists of a screen composed of seven pieces of pasteboard joined together by strips of muslin.

a, a, a, are the pieces of pasteboard; *b*, the muslin joints. The object is placed at *c*, *b*, the lamps at *l*, and the camera



at *M*. A sheet of white paper is placed under the screen, and another sheet on top, resting with one of its edges on the cardboard, on which is placed the object, and with the other edge upon the pasteboard screen, thus forming a reflector which increases the intensity of the light.

As we have already said, our experiments for producing negatives and positives with the light of kerosene lamps are based upon the very great sensibility of our dry collodion, which requires in the daylight a pose of from seven to twelve seconds with the portrait objective, and one of from fifteen to twenty-five seconds with the landscape objective. As a general rule, it may be inferred that there is over-exposure when the image does not appear as soon as the

developer with additional ammonia is poured upon it. If the pose is good, the image commences to appear by the deep blacks, and is formed progressively and without interruption in from two to three minutes.

For glass positives, made by contact and direct exposure with two lamps (of an approximate power together of from eight to ten candles), thirty seconds' exposure is more than sufficient; negatives with the double portrait objective require from twelve to fifteen minutes, and with the landscape objective from twenty to thirty minutes. The following table shows the time of exposure for different intensities of light.

For Direct Positives.

Candles.	Seconds.	Candles.	Seconds.
1	240	10	24
2	120	16	15
3	80	20	12
4	60	32	7½
5	48	40	6
6	40	80	3
7	35	160	1½
8	30	240	0
9	27		

Instantaneity (twenty four lamps, each having the intensity of ten candles).

The formula of the collodion is that used by Mr. SUTTON, viz.:

Collodion at 1 per cent. 100 parts
Bromide of cadmium 3 "

The collodion should have a slight excess of alcohol. It should remain on the plate from twenty to forty seconds, after which the plate is plunged in a silver bath composed of:

Water 100 parts
Nitrate of silver dissolved... .. 80 "
Nitric acid 1 drop

After an immersion of five minutes the plate is withdrawn, and washed in the following manner:—

Take a vessel filled with distilled water acidulated with acetic acid. Cover the sensitized plate with this water, and agitate for about half a minute, then pour the water off into another vessel, so as not to lose the silver. Repeat this two or three times, and then wash thoroughly for a minute under a tap. It is easy to verify that the surface of the plate contains no more nitrate of silver. We use for this purpose a well-cleaned sheet of brass. As soon as a drop falling from the plate leaves no black marks on the brass, the application of the preserver may be safely commenced.

The preserver is thus prepared; take

Skimmed milk 100 grammes
Water 200 "
Citric acid 1 to 2 drops

and place the whole on the fire. After two or three ebullitions the casein is formed, and the liquid is passed through a cloth to separate the casein. After having been allowed to cool slightly, add to the liquid the white of an egg. Place the vessel on the fire, and, after three or four ebullitions, filter through paper. The liquid, which is clarified serum, should be slightly green and clear. Now take

Clarified serum 100-00
Pyrogalllic acid 0-20

and again filter. This is our preserver.

The preserver, after the washing, is poured on the sensitized plate, moved to and fro, and then thrown off. The plate is covered again with another coating of the preserver, which should remain on from fifty to sixty seconds, carefully observing that it passes over all the places on which there is no collodion, as, for example, on the corner of the plate by which it was held during the collodioning. Now pour off the preserver and wash again under the tap for from forty to sixty seconds, and place the plate on end on blotting-paper.

After an hour the glass is perfectly dry, and the collodion is so strongly held by the preserver that it is only with effort that it can be removed with the nail. Plates thus prepared may be kept several months without losing their very great sensibility.

The exposure with portrait objectives is from five to ten seconds, and with landscape objectives from twenty to twenty-seven seconds. After exposure, I develop the image by the alkaline process. I prepare three solutions:

No. 1.

Water	...	...	...	100
Bromide of potassium	...	...	...	2

No. 2.

Water	...	...	...	100
Pyrogallio acid	...	...	...	0.5

No. 3.

Water	...	...	...	50
Ammonia, liquid	...	...	...	50

I pour into the developing dish three cubic centimetres of the solution No. 1, to which I add thirty cubic centimetres of solution No. 2. I wash the impression plate under the tap for a few seconds, and, after draining, cover it two or three times with the prepared mixture for the space of a minute. I then add from five to eight drops of the ammoniacal solution No. 3, and allow it to cover the glass; when the image is slow to appear, I again add from four to five drops of the same solution, and the image commences slowly to develop itself. I wait for a few seconds, and add again a few drops of solution No. 3. In four, five, or at farthest ten minutes, the development is ended, and it can be brought to the required intensity by the ammoniacal developer alone, or by stopping, washing, fixing with a saturated solution of hyposulphite of soda; again washing and drying. If it is found that the image has not the required degree of intensity, it can be taken up the next day, or the same day, and exposed to diffused light with the ordinary strengthener, composed of

Water	...	...	...	100
Pyrogallio acid	...	...	...	0.5
Citric acid	...	...	...	0.5

and a few drops of nitrate of silver at 5 per cent.

The image finished, it is covered with the solution of hyposulphite of soda, carefully washed, and dried. The collodion holds very strongly to the glass, but, when many prints are required, the plate may be varnished, the varnish covering well the coating of dry serum.

In printing positives by lamplight, I make use of a special bromized paper, prepared in the following manner:—I take ordinary albumenized paper, and I float it for thirty seconds at the farthest on the following solution:—

Albumen	...	...	...	100
Serum	...	...	...	60

In which I have dissolved—

Bromide of potassium	...	...	...	2
Citric acid	...	...	...	2

After having mixed these ingredients, I beat them to a froth, and then allow the liquid to settle; then I filter through cotton or sponge. This dried paper keeps for a long time, and the sensitizing is done in the following manner:

The silver bath is composed as the negative bath of

Water	...	...	...	100
Nitrate of silver	...	...	...	18

The albumino-bromized paper is plunged into this bath for four or five minutes; it is then placed in a dish filled with water, acidulated with acetic acid, and is allowed to remain until another sheet is prepared in the silver bath. It is then placed in a bath of water, in which it is allowed to disgorge for the same space of time, and is carried to a flat dish, in which has been poured a coating of our preserver. It is allowed to float thirty seconds, and finally carefully washed in filtered water and dried. Paper thus prepared preserves its brilliant aspect, and gives prints as fine as ordinary albumenized paper. The dry sensitized paper

keeps very well for a month; I have not kept it longer. The positive, with the light of two lamps, is sufficiently impressed when the image shows itself faintly in the deep shadows. Fifteen minutes amply suffice with the light of two lamps, and even after an exposure of ten minutes the development is satisfactory, and in a half-hour the operation is completed. I make the developer in the following manner:—

Water	500
Pyrogallio acid	0.50

After solution I add

Acetate of lead	0.10
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and I clarify the liquid, which has become milky by the addition, drop by drop, of a saturated solution of nitric acid. It is necessary to avoid the addition of the solution of nitrate of silver, which causes the image to appear more quickly, but at the same time injures its quality, as the image is liable to be covered with a precipitate of silver, which produces objectionable shadows, and shows dark in the whites. Several prints may be developed at the same time on the same dish.

A FEW WORDS ON CLEANING THE DAGUERRETYPE.

BY M. P. SIMONS.*

As Daguerreotypes are frequently brought to photographers to be copied into photographs, it is well, both for them and their patrons, that they should know the best and safest mode of cleaning them, which should be done, if required, before copying, that the best results may be had in the copy. In cleaning Daguerreotypes, first commence on the back, and get that free of all foreign matter, such as wax, glue, sealing-paper, &c. This can be done best by scraping it with a knife, being careful not to bear hard enough to indent the plate. Some brands of plates—and the best pictures will be found on them—are very soft and easily marred. No water should be used at this stage of the operation, but, if it should be thought necessary, see to it that it does not run on the under side and dry on the picture. This will sometimes occur, and leave a "damned spot" that will not "out," do what you will. I have seen some valuable Daguerreotypes very much disfigured, and not a few irrecoverably ruined, by carelessness in this respect alone. When the back is cleansed of all soluble matter, then you may venture with care to clean the picture. This can be very effectually accomplished by simply washing with clean water as long as you do a negative, and, while wet, flowing on the picture as much as it will hold of liquid ammonia, full strength; keep on for a few moments, wash well after this, and set up to dry; use no heat. This you will find to dissolve and remove anything that is likely to be on the picture much better than cyanide, and without the risk of spoiling it, which money can't replace. Cyanide, in my opinion, should never come in contact with a Daguerreotype except in extreme cases. For instance, when a Daguerreotype from bad usage is in the last stages of decay, and the picture would be worthless unless cleaned, then it may be experimented on with cyanide, or anything else, as powerful medicines are sometimes administered to the sick when there is but little hope of recovery. Very frequently the trouble is only with the glass. In fact, if the picture has been properly made and well gilded, the dirt that seems to be on the picture, obscuring it like a dark cloud, can in most cases be lifted off with the glass. Several instances of this kind have occurred with me, where mothers have brought Daguerreotypes of their deceased children, to be copied off "before entirely faded out," and I have found, more often than otherwise, on removing the glass, that the pictures were intact and as bright as when made, needing only dusting with a soft brush to prepare them for copying.

* *Anthony's Photographic Bulletin.*

The Photographic News.

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THE AMERICAN INTEKNATIONAL EXHIBITION OF 1876.

A FEW weeks ago we called the attention of our readers to the efforts our American brethren were making to secure a worthy display of the photography of the world, in their forthcoming International Exhibition to be held in Philadelphia next year. The separate building or photographic hall, to which we before referred as in contemplation, it is now resolved shall be erected, and every facility for a grand exhibition secured: it only remains for photographers throughout the world to co-operate heartily. We have received from the exhibition committee an appeal to the photographers of the Old World to which we have pleasure in giving publicity, and in seconding most earnestly its request.

"The Photographers of the United States to the Photographers of Foreign Countries, Greeting,

"Fellow Artists: We are striving to secure for exhibition in Photographic Hall, to be erected within the limits of the *International Exhibition of 1876*, the most worthy representation of our art which was ever exhibited. We want to see a display made of everything photography has ever done or can do, and we call upon you to join us in the effort to the best of your ability. Ample space in a choice light will be provided for you, and every attention given to your interests. Your resident commissioners will supply you with all necessary information as to space, and the arrangements for shipping, &c.

"Further than that, we will be glad to inform you upon application.

W. IRVING ADAMS, 419, Broome Street, N. Y.

A. BOGARDUS, 872, Broadway, N. Y.

J. W. BLACK, 157, Washington Street, Boston.

A. HESLER, Evanston, Illinois.

A. MOORE, 828, Wood Street, Philadelphia.

W. H. RULOFSON, San Francisco.

W. H. RHODES, 1800, Frankford Avenue, Philadelphia.

I. B. WEBSTER, Louisville, Kentucky.

V. M. WILCOX, 591, Broadway, N.Y.

EDWARD L. WILSON, 124, N. Seventh Street, Philadelphia."

PORTRAIT NEGATIVES: HOW MANY SITTINGS SHOULD BE GIVEN.

How many sittings may a customer reasonably demand before being satisfied? This is a question which has arisen in the practice of every professional portraitist, but has never received a definitive answer. The limit must depend much upon a variety of circumstances, one of the most important of which is the patience of the operator. The patience and politeness of the portraitist were sorely taxed, who, when an old and ugly sitter, after a dozen sittings, said discontentedly, "I want my portrait taken like that," pointing to the card of a young and beautiful

woman, replied, "Well, madame, you had really better have that, and call it your portrait, as that is the only mode I can suggest in which you can secure a picture like that!" An attempt has recently been made in America to obtain a legal decision as to the respective rights of the photographer and sitter. The *Daily News* briefly records the details so far as they have transpired. After some reflections on the new offences developed by new arts, our contemporary proceeds:—

"The useful and comparatively harmless process of photography seemed hitherto to have developed no particular forms of iniquity beyond the reach of the civil or criminal law; but a special photographic case has recently been brought before an American Court of Justice, and, under the circumstances, it is not at all astonishing that, after a single hearing, it was found impossible to arrive at any decision as to the points in dispute. A young lady, entering the studio or operating room of a Brooklyn photographer, requested to have her portrait taken, and was thereupon seated in the fatal chair, and subjected to the usual process. It has been suggested that perhaps the patient smiled too soon, 'and thus impressed upon her negative a series of concentric but entirely useless mouths, or that she may 'suddenly have thought of a hated rival, and have thus been betrayed into an unintentional wriggle, whereby the negative was made to bear the image of a broad but nebulous maiden, with features drawn out into horizontal lines, and with expansive hands furnished with dozens of faint and fat fingers.' The photographer, less judicious than most members of his craft, showed his negative, which was disapproved of. He tried a second, which also failed to give satisfaction. He then went on taking impression after impression, until at last he had no fewer than seventeen rejected negatives in hand. The young lady recommended the discomfited artist to 'try again.' But he had made experiments enough, and not only refused to attempt fresh portraits, but claimed compensation for loss of time and for expenses already incurred. The young lady resisted the demand on the ground that no adequate likeness of her had yet been executed, and the report of the first hearing of the case seems to show that no judicial solution of this new and interesting difficulty is likely to be arrived at."

AN IMAGE DEVELOPED WITHOUT PREVIOUS EXPOSURE.

An interesting result has just been obtained by Dr. Liesegang which ought not to be passed over. It is the formation and development of a picture without any exposure to light. A carbon print developed upon glass was permitted to rest over a saucer, for a long time, containing hydrofluoric acid and fluoride of sodium. In this way a delicate etching was produced upon the glass, not alone in the high lights, but in all the half tones as well.

The gelatine image was hereupon entirely removed, and after being carefully rubbed with soft paper, the etched plate was coated with iodized collodion, sensitized, and then developed at once in the ordinary fashion. There was then gradually developed an exact negative picture of the etching; but this picture, consisting of bright metallic silver, was not upon, or in, the collodion film, but between the film and the glass, so that after washing off the collodion film altogether with a mixture of ether and alcohol, it remained unchanged upon the surface of the glass. The reduction of the silver had therefore commenced in the rough portions of the glass. The stains and spots which result in the ordinary way from the use of imperfectly cleansed plates are also due to (in the same way) precipitates of silver between the film and the glass, and it is for this reason why they are seen so much better from the glass side. Whether this plan of depositing a silver image upon glass can be utilized in any manner remains to be seen, but the experiment is one which deserves to be chronicled.

THE PHOTOGRAPHIC EXHIBITION.

PICTORIAL SUBJECTS.

WE have before remarked that the exhibition of this year is poorer in essentially pictorial subjects than any we remember for many years past. The opponents of the art claims of photography, those who affirm that at best the products of the camera are but mechanical transcripts of the subjects, will doubtless hail the result as a satisfactory proof that photographers are abandoning the notion that works of true art can be produced by sun painting. This notion is, however, negated by the fact that amongst the few pictorial studies contributed, there are some which substantiate those art claims in a manner beyond cavil or question. The varied contributions of Mr. Faulkner alone, if no other pictorial work had ever been attempted by photography, would satisfactorily demonstrate that, in the hands of a true artist, photography is scarcely less plastic than painting, whilst in its subtle truth to nature, it snatches "a grace beyond the reach of art." We have already briefly noticed the charming series of baby sketches enlarged by the powder carbon process from instantaneous negatives, as well as the smaller studies of children. The finished carbon enlargements of "Dorothy Morrison," and "Simplicity," have continued to rivet the attention, and secure the attention of all visitors—unfortunately, in some instances, with a result not intended. Many visitors, whilst they have warmly admired, have believed they were examining reproductions from Sir Joshua Reynolds, instead of photographs from nature treated after his manner. Recently Mr. Faulkner has made another charming addition to the exhibition, in a full-length enlargement of "Dorothy Morrison," on a plate twenty by fifteen, also produced by the powder carbon process. The admirable pose and treatment do the fullest justice to the sweet simplicity of the charming child: the picture is in every way delightful, and as truly a work of art as any painting hung on the walls of the Royal Academy.

Amongst the contributors of pictorial subjects to the present exhibition is Mr. Frank Sutcliffe, and in all his work there is a true artistic feeling. In most cases his aim is not too ambitious; his subjects being simple, generally belonging to rustic nature. Unfortunately, in more than one instance, his smallest pictures have been "skied" by the hangers. "It's me, Grannie" (89), a charmingly delicate little picture, as we ascertain by the use of a lorgnette, is in this position. "Tired of Waiting" (157) is probably his best, as it is his most important contribution. The subject here is simple, and in treatment as well as subject it somewhat resembles more than one picture which has appeared in the exhibition in former years. A village maiden is leaning against a rustic rail-fence, manifestly wearied with keeping the tryst which somebody has disregarded or forgotten. The figure is good, is well placed, and tells its tale. The landscape is very admirably chosen, and finely rendered. "Tandem" (164) is a capital bit of nature. A rustic cart, with a couple of cart horses yoked tandem fashion, are caught in picturesque position, and very successfully photographed. Mr. Sutcliffe has some other contributions all possessing excellent qualities.

Mr. A. Ford Smith sends one of the most ambitious, and, at the same time, one of the most effective, of the pictorial compositions at the present exhibition. "Olden Times" (111) is a large photograph (about 22×15) consisting of figures and a singularly fine interior. The figures in costumes—apparently of a period about three hundred years ago—consist of a seated cavalier and a lady advancing towards him. There is no especial story told, or sentiment illustrated. The aim appears to be rather to depict an ordinary scene of the period, the interest centring more in the still life of the subject than in figures. These are quiet, easy, and graceful, admirably photographed, full justice being done to the gorgeous

costume. The interior and its antique accessories are singularly fine; the retiring quality of the landscape seen through the window is very effective. We have rarely seen an interior rendered more finely by photography. This part of the picture is, we understand, produced from an enlarged negative on waxed paper, and it is probable that something in the texture which is here very satisfactory and effective is obtained by the use of this kind of negative, better than it could have been by means of a direct collodion negative. We may remark, *en passant*, that a cabinet portrait not in the exhibition, but before us at this moment, illustrates the capacity and effect of these waxed paper background negatives very efficiently; the landscape background to a figure consisting of a girl gathering ferns is singularly atmospheric and retiring, and exhibits no trace of the masking process.

Mr. F. Hollyer, who has been chiefly known at photographic exhibitions as a successful reproducer of modern paintings, sends some very successful studies of animals, valuable in themselves for their pictorial qualities, and almost beyond value to many artists as aids to painting. His "Sleeping Beauty" (148) is a capital portrait of a sleeping bull-dog—a splendid animal, and hideously ugly enough to meet every canon of beauty laid down by "the Fancy" in relation to their "dawgs." "Shoeing" is one of the most perfect examples of foreshortening we have ever seen. A splendid dapple-grey horse is in the hands of the smith, who, with the near fore-leg of the animal lifted, is engaged in shoeing him. The hind quarters and a little of one side of the horse are presented, and are singularly fine in drawing and relief. The picture and photograph are alike admirable. A calf led—or, rather, declining to be led—by a little girl (154) is another effective bit of nature. Mr. Walter Noel Hartley sends two or three clever little sketches. No. 99—"In an orchard"—is hung beyond the reach of examination. No. 224, catalogued "A Cross Boy," proves on examination to be a "A Crow Boy;" this, and "Waiting for the Master" (246), are capital studies of a rustic urchin in smock frock. A number of examples of the work of the late O. G. Rejlander have been sent, all possessing the unmistakable stamp of the master upon them; but several of the enlargements which are hung, being faded and bad in colour, do not render full justice to the rare powers of the great artist photography has lost. A portfolio of his works on the table will well repay an hour's study.

There are few examples of combination printing in the present exhibition. One of the finest and largest pictorial effects, a portrait group and interior by Mr. Slingsby, which we have before noticed, is produced from one negative. Some of the pictures to which we have referred are produced from more than one negative, and there are, both amongst landscapes and portraits, skies or backgrounds printed in from second negatives. In almost all the best landscapes the skies are printed in, and in many cases with admirable effect. As an exceedingly successful example, we may mention Mr. Crawshaw's picture, a scene on the river Usk (82), in which, although the landscape itself is good, its conversion into an exceedingly fine picture is effected by the admirably fine poetic sky, judiciously printed in. A good background effect from a separate negative is secured in "La Vivandiere," by Mr. H. Garret Cocking, whose pictorial studies we have already noticed. There are two or three more attempts at pictorial effects which we refrain from criticising.

As we have before observed, there are very few examples of special processes, but such as are exhibited are very interesting. The only examples of enamel portraiture exhibited consist of a frame of very fine examples of the powder process sent by Mr. Faulkner. A series of photographic enamel decorations to porcelain cups and saucers are sent by Copeland and Sons. The results are good, but the colour chosen, a bright magenta, is for portrait subjects somewhat unsatisfactory. A series of very fine

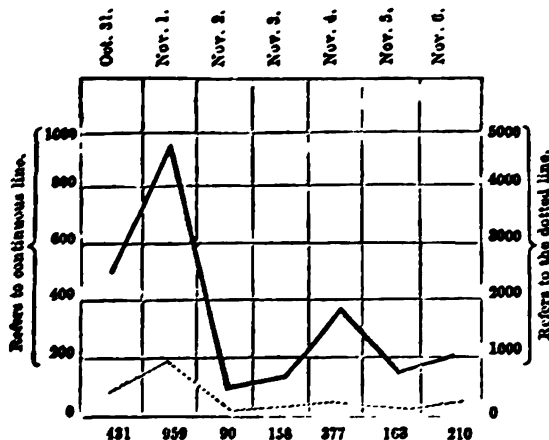
stereoscopic slides of American scenery, and a Holmes' stereoscope, are sent by Messrs. Anthony and Co. Some good lantern slides of subjects connected with the Arctic expedition are sent by Mr. H. Dixon, and some very fine enlargements of microscopic objects by Mr. C. Viles.

METEOROLOGICAL REPORT SHOWING THE VARIATIONS IN THE DAILY AGGREGATE OF CHEMICAL FORCE IN THE DAYLIGHT OF THE SOUTHERN SKY,

FROM OBSERVATIONS MADE AT BLACKPOOL, IN LANCASHIRE,

BY D. WINSTANLEY, F.R.S.

THE past week has been another dark one, though the daily average is somewhat higher than that of the preceding week, being as 341 chemical units to 282. The total amount of light, however, during the whole week (2388 units) is not much more than the daily average for September, and its daily average is less than one-half the daily average for October.



PHOTOGRAPHING THE INVISIBLE.

BY DR. J. SCHNAUS.*

It is not to be wondered at that a process so mysterious as photography should present some phenomena that are inexplicable to the man of science. The mere idea that one could have a portrait taken by the aid of the sun was alone the means of attracting the public in the early days of photography; but custom has long ago worn off all curiosity. Nowadays, everybody allow themselves to be photographed with the greatest equanimity, without troubling themselves for an instant as to how the matter is managed. It is found necessary, therefore, to shake up the curiosity of that creature of habit, man, once more, to get him to take further interest in such a matter as portrait photography; and thus it comes about that we hear of spirit photographs and ghostly wonders, and of inexplicable and surprising effects of light which result in the camera. The accepted assertion, that there are things between earth and heaven of which man does not even dream, was first of all attempted to be demonstrated by means of photography in that land of humbug, America, for from thence come to us the first spirit photographs. We Germans had no demand for these kind of pictures, and had gone no further than to produce so-called magic pictures, the only thing magical about which was the name; and these prints did not profess to have anything to do with the unearthly and the uncanny. We were not, however, altogether free from the influence of spiritualism, for in 1862 there were produced in this country spirit photographs also, in the very capital of

intellect, too, as Berlin has with truth been called. The discoverer of these was the late Baron of Reichenbach, a well-known savant in technical chemistry, and it is to be deplored that through the influence of certain sensitive persons, whose sentiments he did not in any way share, he should have led people on upon an erroneous path, imparting them to believe that spirit photographs were really *bona fide* productions.

Several bodies appear luminous to people after their eyes have been accustomed to darkness—as, for instance, large steel magnets, and big crystals; water shaken up in a bottle will emit phosphorescence, and luminous waves may at times be seen coming from the fingers, sometimes greenish, sometimes reddish, according to the side of the body. But these phenomena are visible only by very sensitive or delicately constituted people, and it was with the object of proving their actual existence to others that Reichenbach made use of photography. He took it for granted that the sensitive photographic plate was also delicately sensitive, or that the reddish or greenish light exerted an action upon the film without being visible, in the same way as the ultra-violet of the solar spectrum. Reichenbach acted to work with this notion, not, however, in proximate Vienna, but in sceptical Berlin, so that he might convince the unbelievers, and secure the services of a photographer there, whose experiments in this direction had been already successful. Even a large number of scientific men assisted in the research, we are told, and it has always seemed to us strange, supposing the experiments to have been successful, as was stated to be the case, that none of these gentlemen said a word on the subject afterwards in the public prints.

In the exhaustive manual of Professor Vogel one looks in vain for the record of experiments made to secure impressions of phosphorescent phenomena, and these, if they had really taken place, would scarcely have escaped the learned author, for they would have been too curious to have evaded the attention of learned societies.

In the pages of the *Gartenlaube*, one of the most popular of German magazines, the experiments of Reichenbach were nevertheless reported as perfectly successful; and in the scientific periodical called *Leopoldina*, the organ of a German Academy of Natural Sciences, there is published in Vol. III., 1862, a report by the contemporary president, Kieder, concerning these experiments, in which there is the following: "From Berlin we have received from our honoured member, Baron Reichenbach, of Castle Reichenberg, four small printed communications upon the experiments undertaken by him in connection with the photographic power of phosphorescence emanating from the nervous human system and from crystals, and these experiments are represented as being successful."

These researches of Reichenbach have from the very first been a source of considerable interest to ourselves, and we have read his pamphlets with the more attention as we have seen similar luminous phenomena in the persons of somnambulists, and have made a study of such nervous appearances, although till now with a negative result. For this reason we have lately felt impelled to institute further researches, at any rate with crystals—for sensitive persons or somnambulists were not at our disposal—in order to set the matter completely at rest. These experiments have been carried out with great care and attention at the photo-chemical laboratory of Jena, so that implicit reliance may be placed upon the results. Our verdict is, that at present we are not of the same opinion as Reichenbach, viz., that the luminosity emanating from one's finger ends or from the poles of a magnet, or the arcs of crystals, which is seen by very sensitive persons, is identical with solar rays or daylight.

It would lead us too far to relate the control photographic experiments undertaken with this phase of phosphorescence. The experiments described in the third volume of *Leopoldina*, above alluded to, were repeated, and, we may add, with a negative result. There can be no doubt, however, that the results which Reichenbach deceived himself into obtaining

* *Photographisches Archiv*

proved the first steps in spirit photography, and hence we now get all sorts of ghostly photographs.

In the production of the so-called spirit photographs of the present day, it is only a question as to how the public can be most surely and easily deceived by the aid of photography. Many plans may be pursued by the photographer, so that it is a simple matter for each to produce his pictures after his own manner. The main thing to be attended to is the perfect stillness of the person photographed, and as the sitter cannot see what is going on behind his back during the exposure, if there is no noise made, and sufficient space exists between him and the background, he is easily deceived. A ghostly form may be sketched on the white background by means of sulphate of quinine solution, and this sketch, although invisible to the eyes, produces an effect upon the negative. Dodges of different kinds in manipulation may be resorted to, such as the exposure of the portion of a plate at one time only, as in the case of the "double" portraits introduced some time ago. An impression may first be secured upon one half of the plate in another studio, and then brought in for a second exposure.

If the sitter is himself in league with the photographer, then the most ghostly effects are easily managed, and, by opening and shutting the lens at opportune moments, the depiction of spiritual apparition is rendered very easy.

Correspondence.

INSTRUCTION AT EXHIBITIONS.

SIR,—May I suggest that the next photographic exhibition be made a means of conveying instruction as well as pleasure, by each exhibitor affixing to his pictures the date of the negative, name of lens used, and time of exposure?—I remain, dear sir, yours truly, S. R. M.

Chartham, Canterbury, November 8th.

[There might, possibly, be a legitimate objection to encumbering the mount of a picture with inscriptions or memoranda, as all such labels are distracting in an art sense, and often materially rob a picture of much effect. But there cannot be a doubt, we think, that much valuable instruction might be gleaned from exhibitions if all interesting details were stated respecting each picture in the catalogue, where it would remain for ready reference.—ED]

WARMING DARK ROOMS.

SIR,—I notice in last week's issue of the News that Mr. J. D. Hannah recommends a lamp stove as an efficient means of warming the dark room. My experiments, extending over many years, have convinced me that no means which allows of the products of combustion being disseminated in the room is good, but positively injurious, to most, if not all, chemical effects. Dry plates, for instance, are great tell-tales if the atmosphere is impure, which dry plate workers have often found out to their cost.

Mr. Gough, in pointing out the particulars of his drying-box, explained to me that the products of combustion, whether from gas, coal, oil, or any other substance that betrayed its presence by the smell, would act as a retarder, and render dry plates insensitive: this is my own view and experience. I would therefore suggest that the oil stove, or whatever is employed, should have a small pipe leading the products of combustion away from the dark room.—I am, sir, yours respectfully, JOHN HOWARTH.

111, Thornton Road, Bradford, Nov. 9th.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

DEAR SIR,—Will you kindly allow me to announce through your valuable columns, that the Council of the

Photographic Society has granted the exhibition on Thursday evening, November 18th (open at 7), for the benefit of the funds of the Photographers Benevolent Association? Tickets of admission (sixpence each) to be had from me, or at the door of the exhibition, 5, Pall Mall, East, on the evening of the 18th.—I remain, yours truly, 18, Kirchen Road, Ealing Dean, W. W. T. WILKINSON.

URANIUM DRY PLATES.

SIR,—Uranium dry plates have found frequent and favourable mention in your columns of late; but it does not yet seem to be understood that a rapid dry plate has better keeping qualities than a slow one. This being the case, they are much more desirable to work with, as we are enabled to get "life" into our landscapes.

The following letter from the chief photographer on board the *Challenger* is important, as confirming the statement I make above, and I shall be glad if you will publish it:—

H.M.S. *Challenger*, Yokohama, 15th June, 1875.

SIR,—It gives me great pleasure to acquaint you that the dry plates supplied to this ship three years ago are working well, being fully sensitive, notwithstanding the great trial that they have been subjected to—extreme cold and heat. On some plates I found damp spots on the film which stain the picture, and hence I discard them; but on selecting plates I travelled up 2,500 feet (where the wet process seemed impossible) and obtained perfect negatives. I would suggest that mere substance be placed between the plates, as I have found them sticking together, and hence the same spots on each plate. I am using your new developer, which works well.—I remain, yours obediently, (Signed) JESSE LAY, Photographer.

To Col. Stuart Wortley.

The spots spoken of are due to the pieces of packing-paper slipping, and the faces of the plates coming in contact.—I am, &c., H. STUART WORTLEY.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE sixteenth annual general meeting of this Society was held in the Hall, 5, St. Andrew Square, on the evening of Wednesday, the 3rd inst., the President, Dr. THOMSON, in the chair. The minutes of last general meeting were read and approved, and Messrs. James Gordon, —Hunter, and Lieutenant Gilbert were admitted ordinary members.

The SECRETARY then read the report of the council for the past year, which was as follows:

The council has much pleasure in submitting the fifteenth annual report. The year now closed has been one of unbroken prosperity, and the Society continues to occupy its prominent position amongst the scientific and literary institutions of the country.

During the session there have been held eighteen meetings, nine of which were ordinary, three popular, and six out-door, including the annual excursion. The attendance generally at all these has been even greater than during former years; and, at the ordinary meetings, the following communications were brought before the Society:—"On the spirit of the journals," by W. T. Bashford; "On an unsuspected cause of spots on carte-de-visite and cabinet photographs," by T. W. Bashford; "The photometric value of the different lights used for lantern purposes," by John M. Turnbull; "The progressive results of the past session," by Dr. John Nicol; "Extracts from a letter to a young photographer," by Alexander S. Mackay; "On the various styles in portraiture," by John M. Turnbull; "Art criticism," by W. Neilson; "On the use of permanganate of potash as an intensifying agent," by W. H. Davies; "The aid the fine arts have derived from photography," by Dr. Hunter; "On the colouration of statuary," by R. H. Bow; "A substitute for ground glass in the camera," "The use of the actinometer in landscape photography," and "An improved form of spirit lamp," by J. M. Turnbull.

There were exhibited at these meetings the following apparatus

and pictures:—A collection of photographs of the late Oscar G. Rejlander, by Mr. Constable and Mr. Elliott; a large collection of photographs of works of the great masters, by Mr. Black; an improved camera in which dry plates could be changed without slides, by D. Aird; an improved drying box, by W. Dallas; copies of works by the Italian masters, by Dr. Hunter.

Four distributions of photographs took place during the session; the photographs were kindly contributed by the following gentlemen, viz.:—Dr. Thomson, W. H. Davies, R. G. Muir, Ross and Pringle, G. A. Panton, Colin Sinclair, Alexander Mathieson, Alexander Nicol, and Dr. John Nicol. The council has reason to believe that these distributions have tended materially to induce a more general interest in the Society's operations, and as there is a number of members who promised contributions, who have not yet been called upon, they hope this important feature will be continued.

The popular meetings were, as usual, largely attended; the subjects of exhibition and illustration were:—"Egypt and the Nile," by Dr. John Nicol; "The North and West Highlands," by W. H. Davies; "Sketches of English life and character," by Dr. John Nicol.

The out-door meetings were held at Colinton, New Battle, St. Monance, Almond Dell (annual excursion), Preston Grange, and Bonally.

The following donations were received during the year, viz.: A very fine photographic portrait of the late W. D. Clarke, Esq., from Mr. W. H. Davies; two photographs from Mr. Wane, Isle of Man, through Mr. W. T. Bashford.

It will be seen that the Society has shown its usual amount of activity, and accomplished a fair share of practical work.

During the session the membership has not materially changed; thirty-six members have been added to the roll, seven have resigned, and one has been removed by death. The Society now numbers three hundred and nine.

From the treasurer's report it will be seen that the financial position of the Society is encouraging and satisfactory.

The report was adopted, and the treasurer submitted an account of his intromissions, showing that the financial position of the Society was in every respect satisfactory.

The meeting then proceeded to the appointment of office-bearers for the ensuing year, when Dr. Thomson (president), E. R. Yerbury (hon. secretary), Dr. John Nicol (corresponding secretary and lecturer), and T. A. Niven (auditor), were unanimously re-elected to the various offices; Dr. J. A. Sidey was appointed junior vice-president; and Colin Sinclair, John Lessels, and Alexander Asher, councillors in room of those retiring by rotation.

Dr. Thomson said he begged to thank the members of the Society for the honour that had been again conferred on him by his re-election to the office of president. What he said last year he could not avoid saying again, that he had grave doubts as to the wisdom of their choice. He, however, assured them that, so far as lay in his power, everything should be done to advance the interests of the Society, and that with the cordial support and co-operation of the office-bearers and council he felt assured that the session now begun would be as successful as that just brought to a close. For some months the interest of the Society would be mainly in its ordinary meetings, and the principal efforts of the council would be to secure the reading of suitable and interesting papers for those meetings. This, he said, was a matter in which the members generally could materially assist the council, and he hoped that whenever a member had anything worth bringing before a meeting, he would not wait till asked, but at once communicate with the secretary on the subject.

Mr. WILLIAM NELSON then proposed that the thanks of the meeting be given to the office-bearers under whose management so great a measure of success had been attained. No doubt the best expression of thanks that could be given was their unanimous re-election; but still the usual formal vote must not be omitted. He also moved a hearty vote of thanks to the retiring councillors. They had the satisfaction of knowing that they had contributed largely to the success of one of the Society's most successful sessions, and while he sympathised with them in their relegation to the ranks, he had no doubt that, as private members, they would continue to do all in their power for the interests of the Society. Both votes were carried by acclamation.

The CORRESPONDING SECRETARY then read a communication from Mr. D. Winstanley, of Blackpool, enclosing a diagram

showing the daily variation in the aggregate chemical power of the daylight of the northern sky in that locality, which elicited some discussion, the outcome of which seemed to be the desirability of some standard unit of actinism which would be understood and generally accepted. Until this was attained, little benefit could be expected from such a course of observation.

The thanks of the Society were given to Mr. Winstanley, and the meeting adjourned.

PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

At the June meeting Mr. H. J. NEWTON presided. The minutes of the last meeting were read and approved.

Binocular Microscope.—Mr. CHARLES B. BOYLE exhibited his binocular microscope with a photographic attachment. The eye-piece is taken off, and a plate-holder put on in its place. Over the object glass is placed a photographic lens of short focus. Behind the insect to be photographed is a background; and there are two mirrors, one of which should illuminate the insect brightly, and the other sufficiently to soften the shadows.

Mr. MASON said that in his experience, in working with the microscope, he had found that there was an illumination inside of the tube. There was always great difficulty in getting rid of the ghost. He had tried various expedients, but finally lined the tube with black cotton velvet, with little or no gloss and a long nap, which entirely removed the difficulty.

Mr. BOYLE remarked that in every telescope there are several ghosts, caused by the reflection of the light from the surfaces of the lenses, but they are at different distances from the focus, and the only difficulty from a ghost is when it is very near the focus.

Emulsion.—The PRESIDENT exhibited specimens of negatives and prints, illustrating his experiments with the dry plate emulsion process, and read the paper on that subject published in our June number.

Mr. J. B. GARDNER said that when Mr. Newton first announced this process, he had been very much interested in it, thinking it would be a great acquisition if a photographer could go out and make pictures without taking his bath with him. This morning he had gone with the president to Central Park, where they had taken six plates with an exposure of from five to thirty seconds, showing that there was very great latitude in the time that may be given, and that it may be regulated very readily by the manner in which the pictures are developed. Starting cautiously with a weak developer, if a stronger one is required it may be used without injury to the plate. He had been much pleased with the method, and he had never known any process coming up to his expectations so fully as this. He moved a vote of thanks to Mr. Newton, which was carried.

A Longitudinal Diaphragm.—Mr. ALEXANDER BECKERS.—Many years ago, when I was engaged in making stereoscopic pictures, I tried the effect of using the camera, not with a round opening, but with a slit. When the slit was perpendicular, the effect would be that the perpendicular lines would be more strongly marked than the horizontal ones, and so when the slit was horizontal, the effect upon the picture would be that the horizontal lines would be more strongly marked. I would suggest, in galleries especially with a narrow skylight, the use of the horizontal diaphragm; it would give a better effect. I found that it would produce a better effect in taking stereoscopic pictures. Animals of prey have an eye that contracts in that form, and it gives the measure of distances better than a round pupil. A cat, for instance, will open the pupil fully to see an object, and then contract it to obtain the distance in order to bound for it. The eye of the chamois has the slit the other way, and consequently they see the horizontal prominences better, and can make their bounds with greater safety. The distance of the eyes from each other determines the apparent size of objects. When stereoscopic views were taken some years ago, with the lenses wide apart, the objects appeared very small. Stereoscopic views can reach only a certain distance. Beyond that distance the effect is the same as if looked upon with a single eye, because the angle between the two eyes would be imperceptible. Each animal sees objects of a size in proportion to the distance between its eyes; so that in the eyes of the elephant, fourteen inches apart, objects appear much smaller than to us.

Mr. BOYLE remarked that all herbivorous animals have the

slit of the eye horizontal, and all carnivorous animals have it the other way. It was not the distance between the eyes which determined the apparent size of an object, but the angle of the convergence. In separating the lenses, the angle produced was the same which would be produced by bringing the object towards us; and consequently the object appeared near and smaller. To the elephant an object does not appear smaller because his eyes are further apart, and the slit of the eye is of no assistance in measuring distances.

Mr. H. M. PARKHURST stated that if the pictures of a stereoscopic view are gradually separated, the picture will appear to recede and to grow larger. Assuming the distance of the eyes to be two and a half inches, and one minute of space to be the smallest space that can be discerned by the naked eye, the stereoscopic effect cannot reach beyond the distance of seven hundred and fifty feet.

Dr. FARMER remarked that lines standing vertically appear longer than in a horizontal position.

Mr. BECKERS remarked that the aperture of a circular lens in the stereoscope could not exceed the distance of the eyes, but by extending it vertically we can get more light.

Talk in the Studio.

SOIREE OF THE PHOTOGRAPHIC SOCIETY.—On Tuesday evening last the Photographic Society of Great Britain held a soiree in place of the usual meeting opening the session. The handsome room in which the exhibition is held in Pall Mall was comfortably filled, although the attendance was not large, and the evening was a successful and pleasant one.

THE FERRANTI MODE OF FINISHING ENLARGEMENTS.—It will interest some of our readers to know that the patent of this successful method has been secured by the due payment of the stamp fees for a further period of four years.

THE AUTOTYPE COMPANY.—It will also interest photographers to learn that Messrs. Spencer, Sawyer, and Bird are extending their business arrangements. Some years ago they acquired the patents, plant, and premises, of all the working and productive operations of the Autotype Company, the Company subsequently confining its operations to the publication of works of fine art, produced in carbon. Messrs. Spencer, Sawyer, and Bird have now made arrangements to take over the whole of the business and the premises which remained in the hands of the Company, uniting fine art publication to their other branches.

PHOTOGRAPHIC FASHIONS.—We have been favoured by Messrs. Jackson, Brothers, of Oldham, with a sheet of photographic fashions of gentlemen's hats, which we understand they have for twenty years past been in the habit of producing regularly. The hats are admirably photographed, forming a circular design in the sheet, which is altogether effective. It is somewhat surprising that hitherto comparatively little has been done in photographing designs, patterns, and fashions; but it is probable the practice will extend as its value becomes better known.

LANDSCAPE ENLARGEMENTS.—Referring to our notice of enlargements at the Photographic Exhibition, the Woodbury Permanent Printing Company write to point out that their contributions are not all portraits, as we had intimated, four of their contributions being enlarged landscapes, Nos. 280, 289, 290, and 305 in the catalogue.

"ART AND NATURE.—Wife (looking at husband's photo.): 'How beautifully your hair comes out, Robert.' Husband (rapidly bald'ning): 'Ya'as, by Jove, in combfulls!'"—*Fun Almanac*.

PHOTOGRAPHY AS A MORAL TEACHER.—In a volume of sermons preached in the Memorial Church, Baltimore, by the Rev. Octavius Porinchief, occur the following passages:—"Our enemies are not always blind. The worst thing about them sometimes is their unpleasant way of telling the truth; and then it is not always that they are unpleasant so much as the truth they tell. . . . They take your photograph, and I think that photographs are generally very unsatisfactory and disappointing things. But the moral effect of a photograph is good.

It makes us feel humble. We cannot quarrel with it. There it is, there is no disputing it—it is ours. It is true we never get two alike. We cannot appear always all we are. There is always a crushing possibility left us that we have something better in reserve—something that never can be taken—something that nobody ever sees. But our enemies are often only so many camera-obscuras, to show us how, at least, it is possible for others to see us." In another part of the same volume the author thus gives his opinion of the art status of photography:—"Art was once pyramids and sphinxes and temples; now it is locomotives and spindles; once it was madonnas and saints; now it is Niagara and the Rocky Mountains, the Yosemite Valley and photographic production."

ON A NEW REAGENT FOR GOLD.—M. Sergius Kern, of St. Petersburg, describes, in the *Chemical News*, a new reagent for gold, with the effects of which all photographers who have used the sulphocyanide toning bath will be familiar. He says:—"Studying the action of sulphocyanates on some double salts of gold, I have found a remarkably delicate test for gold; experiments prove that even less than 0.001 gramme of gold may be easily detected by using my reagent. The gold of the sample under analysis is first separated from foreign metals, and next converted, by means of sodium chloride, into sodio-gold chloride (NaAuCl_4); the solution is then concentrated by evaporation. In order to detect gold, an aqueous solution of potassium sulphocyanide (KCyS) is used, containing for one part of the salt about fifteen to twenty parts of water. About six grammes of this solution are poured into a test-tube, and some drops of the concentrated solution, obtained by treating the sample as described above, are added. If gold is present, a red-orange turbidity is immediately obtained, which soon falls in the form of a precipitate. On gently heating the contents of the test-tube the precipitate dissolves, and the solution turns colourless. The reagent is so delicate that one drop of a solution of sodio-gold chloride (one gramme of the salt dissolved in forty grammes of water) gives a very clear reaction. This reaction showed the existence of very interesting double sulphocyanides of gold. Researches in this direction are being continued, and, when finished, the results of the experiments will be communicated.

CELLULOID.—Celluloid is a manufacturer's name given to a species of collodion, or dissolved and dried gun-cotton. Common cotton, the refuse of cotton mills, and other vegetable fibre, is dipped in a liquid composed of nitric acid and sulphuric acid, then drained, washed in water, and dried, when it is found to possess highly inflammable and explosive qualities, and is termed gun-cotton, as it may be used as a substitute for gun-powder. It has twice the power of the latter. This prepared cotton may be dissolved in ether and alcohol, when it forms a thick transparent liquid known as collodion. This is the material used by photographers, who, in taking a portrait, spread a thin film of collodion liquid on a glass plate. The ether and alcohol soon evaporate, leaving the dissolved cotton to dry upon the glass in the form of a thin membrane or skin, which receives the silver compounds used in taking photo pictures. Collodion, when dried in any considerable mass, forms a tenacious, transparent substance somewhat resembling horn. If whitening, zinc oxide, and other colouring substances are added to it while in the liquid state, and then dried, substances resembling ivory, hard rubber, bone, &c., result. All such forms are, however, very inflammable. The use of alcohol and ether is expensive as a solvent, and the celluloid makers substitute camphor, the use of which forms the basis of their patent. By peculiar manipulation, involving the combined employment of heat and pressure, they are enabled to produce plates and blocks of dried collodion of beautiful texture and colour, possessing a certain degree of elasticity, with great strength and toughness, and little weight. From these plates and blocks a great variety of merchantable articles are made, such as harness trimmings, jewellery, dental plates for artificial teeth, billiard balls, knife handles, &c. They are a complete substitute for hard rubber and ivory for many purposes, and considerably cheaper. But not only is the manufacture of the crude celluloid dangerous, but even the most finished articles made from it will readily inflame. As a practical experiment, any one may take a strong and highly-polished martingale ring of celluloid, which the strength of a horse could hardly break, apply to its surface a lighted match, and it will quickly ignite like a torch.—*Scientific American*.

To Correspondents.

W. W. M. asks if we, or any of our readers, can, through the medium of the News, give useful information as to the best kind of conveyance (velocipede) suitable for going distances, say ten or twelve miles, capable of carrying eighty pounds in weight of apparatus (portable)? Can any of our readers help our correspondent?

GRAIN.—If you get a grain in one kind of tissue and not in another, it is more likely that the grain is due to the tissue than to the substratum; nevertheless, many samples of collodion would give a granular texture such as you describe. A collodion prepared with pyroxyline made at a high temperature, giving a powdery film, would be free from texture. Albumen would also be quite free from texture; but with care in manipulation no substratum should be needed. If you take care to secure a good safe edge, or if you coat a margin of the plate with varnish or collodion, no washing up ought to occur.

J. T. T.—Neither of the preparations you mention is suitable for producing direct enlargements; both would require development. How far the prints so produced would be of satisfactory quality, or how far permanent, can only be ascertained by trial. In our experience collodio-chloride prints on drawing paper are amongst the most permanent forms of silver prints. We have examples which we printed eleven years ago, still quite unchanged.

A. Y.—Your question, "Can negatives be taken by moonlight?" is somewhat too indefinite for a decided answer. We should ask you, negatives of what? Negatives of the moon itself have often been taken; and we have seen negatives of the moon and the lighted edges of the surrounding clouds. We have a photograph of a white statuette taken by the late Mr. Breeze, which he stated was produced by moonlight; but you could not secure an image of moonlit landscape, for instance, nor, indeed, of objects generally. 2. The spots in your print may be due to minute air-bubbles formed on the surface of the paper during fixation, or to some defect in the albumenized paper.

E.—We do not remember the luting to which you refer. Did the reference to it occur incidentally in an article, or was it a recipe in a distinct paragraph?

NORTH RIDING.—The only mode of determining with certainty the cause of the pinholes is to adopt a series of exhaustive experiments. They are not the kind of pinholes which occur from the use of a bath super-saturated with iodide, but have the irregular size and shape, although all are minute, which characterise the results of turbidity in the bath or collodion. Of course you have filtered the bath carefully, so that floating particles in the solution cannot have caused it. Have you tried different samples of collodion? The newly iodized sample was not a good test, as newly iodized collodion, even after standing a few days, is not always perfectly clean. Are you sure the glass is good and clean? We have met with samples of glass, one side of which had a somewhat gritty surface, which produced similar results. The use of old glasses, which have had varnished pictures on them, will at times, even after very careful cleaning, give such results. You use pump water, which you have used with success before; but pump water is not always precisely the same, especially if surface drainage have access to the well. Sometimes traces of sulphate of silver in the nitrate will cause pinholes; and for this the addition of a little nitrate of baryte to the bath is the best remedy.

J. T. M.—Shellac is the basis of the best spirit varnishes for negatives; but of course in commercial varnishes there is a combination of gum resins. Gum-sandarac, which is used in some, does not give a safe varnish for negatives, as it lacks toughness. The white lac which is bleached by chlorine loses much of its hardness, and gives a worse varnish than the orange lac. The tint of colour is of course a slight objection. Some of the lac varnishes in commerce, which are free from colour, are made from the orange lac bleached by a secret method.

D. H.—Many of the old prints toned and fixed in the old hypo bath have stood remarkably well. Many of them acquired a slightly yellow tint in the toning and fixing bath, but never changed afterwards. Nevertheless a great many more faded, and it would not be safe to return to the old method. It is quite true that, from some cause or other, many albumenized prints of the present day fade very rapidly. Whether it is due to lack of care in producing large commercial orders, or to some imperfection in the paper, we cannot say. 2. So far as we know, there is no difference in the permanency of the print produced by varying the formula of the alkaline gold baths; any of them carefully used, and the prints washed well before toning, should produce good results.

B. L. F.—You can obtain all details of the Autotype Company, at their office in Rathbone Place.

A. F.—Fogging and discolouration in developing paper prints arise from many causes. It may be that the sensitized paper has been kept too long. It may be that the paper has not been kept sufficiently carefully from all trace of light. The addition of a little common salt to the gallic acid developer is a capital restrainer.

G. M. D.—It is impossible to give you any certain idea of the length of exposure which an interior will require, as so much depends on the amount of light admitted by the windows, the colour of the interior, the kind of day, and time of day. You can only judge by the appearance of the image on the ground glass. A landscape lens may be used; but it will be wise to bring the stop closer to the lens than usual. A wet plate is desirable. Use a ripe collodion freely bromized, and not immersed in the nitrate bath more than about half the usual time. Place wet blotting paper at the back of the plate. Try a plate in some room in your own establishment first, making the light as nearly as possible like that in the interior you are about to photograph.

R. M.—An alkaline toning bath, if kept in the light, is apt to become purple by the precipitation of gold. It may probably be quite inert, but you had better try. Add a few drops of hydrochloric acid, and put it aside for a few days; then neutralize with chalk and try.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR OCTOBER.

BY WILLIAM HENRY WATSON.

*Observations taken at Braystones, near Whitehaven,
36 feet above sea level.*

Date.	BAROMETRIC PRESSURE.			TEMPERATURE			Direction of Wind at 9 a.m.	REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1 29.50	29.49	29.49	57°	60°	58°	N.W.	Showers a.m. and p.m. with wind.	
2 29.40	29.37	29.40	51	54	49	W.	Showers a.m. and p.m.	
3 29.50	29.51	29.45	46	54	56	W.	Rain a.m. and p.m.	
4 29.30	29.40	29.49	51	61	56	S.W.	Showers a.m. and p.m.	
5 29.50	29.60	29.74	09	59	52	S.S.W.	Rain a.m. and p.m. Very heavy at night.	
6 29.87	30.00	30.00	53	58	53	W.	Fair, but gloomy. Strong wind.	
7 29.91	29.98	29.99	50	59	53	S.S.W.	Rain p.m. Very strong wind.	
8 29.80	29.67	29.51	54	58	54	S.	Rain a.m.	
9 29.40	29.40	29.40	48	50	48	S.	Rain a.m. and p.m. Heavy.	
10 29.53	29.53	29.70	42	52	48	S.	Rain all day.	
11 29.00	28.96	28.91	44	46	44	S.S.W.	Heavy showers a.m. and p.m.	
12 29.00	29.00	29.07	43	46	38	S.	Rain p.m. Windy.	
13 29.40	29.45	29.07	40	48	41	S.	Fair, but gloomy.	
14 29.08	29.08	29.22	42	48	48	S.W.	A little rain a.m. and p.m.	
15 29.30	29.33	29.40	48	52	42	W.	Showers a.m. and p.m.	
16 29.41	29.41	29.40	46	52	43	S.W.	Rain this morning.	
17 29.40	29.43	29.50	46	52	50	W.	Rain this afternoon. Windy.	
18 29.54	29.52	29.50	51	51	51	S.	Rain a.m. and p.m.	
19 29.47	29.47	29.40	44	47	48	S.	Heavy rain with wind a.m. and p.m.	
20 29.80	29.21	29.16	48	47	46	S.S.W.	Heavy rain a.m. and p.m.	
21 29.16	29.20	29.16	49	56	51	S.W.	Showers a.m.	
22 29.16	29.13	29.13	50	52	51	S.W.	Showers a.m. and p.m.	
23 29.18	29.21	29.49	48	54	50	S.W.	Rain p.m. Windy.	
24 29.70	29.75	29.80	47	50	42	W.	Rain p.m.	
25 29.85	29.84	29.80	40	51	42	S.	Fair, but gloomy.	
26 29.72	29.70	29.60	46	50	44	S.	Rain a.m. and p.m.	
27 29.48	29.48	29.50	44	45	44	S.W.	Heavy rain this evening.	
28 29.61	29.62	29.71	45	46	44	S.W.	Showers this morning.	
29 29.80	29.79	29.78	45	46	46	N.	Fair, occasionally sunny.	
30 29.71	29.67	29.60	42	48	43	N.W.	Fair, but gloomy.	
31 29.57	29.56	29.54	38	46	37	N.	Fair, but gloomy.	

		Summary.			Mornings. Noons. Nights.		
Maximum temperature	observed	...	...	...	59°	61°	58°
Minimum	ditto	...	...	...	38	45	37
Mean	ditto	...	...	...	47	51	47.7

Mean of whole	...	...	...	...	48.7		
Number of days on which rain fell	...	...	...	...	25		
Number of fair days	...	...	...	...	6		
Fair days, gloomy	...	...	...	...	5		
Fair days, sunny	...	...	...	...	1		

NOTES.—The weather of October, as above, was not an improvement on that of the previous month as regards rain; thus putting to inconvenience the farmers, whose anxieties generally were to get their potatoes under cover dry. The turnip crops now also show general signs of decay, doubtless owing to this continued wet weather, which remains up to to-day very stormy.

Chemical Laboratory, Braystones, nr. Whitehaven, November 6th.

PHOTOGRAPHS REGISTERED.

Mr. GIBSON, Scilly Isles,
Photograph of the Bishop Lighthouse.
Mr. LEBCH, Maclesfield,
Two Photographs of Mr. J. Crutcherden Lea.

The Photographic News, November 19, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHIC TRANSPARENCIES IN PUBLIC ENTERTAINMENTS.

SEEING that photographs are viewed to the greatest advantage as transparencies, it seems strange that there should be so few exhibitions of pictures of this kind. It is true, the production of lantern transparencies is every day becoming more widespread, and, with the introduction of carbon printing into the studios, their preparation will be further increased; but very little is popularly known of them at present, for the simple reason that they are rarely seen in public. Sometimes the Polytechnic substitutes a few photographic pictures for the painted dissolving views one usually sees at that institution, but it is rare indeed to see such photographs elsewhere. We remember once witnessing a very fine display of lantern transparencies in Paris, at the French Photographic Exhibition there, and it was at once apparent to us how popular such an exhibition might be made, if only properly managed. Photographic slides passed through the lantern or sciopicon at home are exceedingly pleasant to look at, and when the places or pictures reproduced are such as the spectators feel an interest in, few entertainments can be made so enjoyable as a home exhibition of this sort. If, then, privately, and on a small scale, it is possible to derive entertainments from the mere passing of photographs in review, how popular would the public exhibition of the same kind prove, if well conducted on a large scale, with the accompaniment of music and a spirited dialogue! Imagine, for a moment, Albert Smith again before us, telling us his amusing story of the ascent of Mont Blanc, and instead of showing us painted pictures—not executed by himself, it must be remembered, but by artists, who never saw the scenes they depicted—he were to accompany his spirited lecture with photographs of grand dimensions, taken on the spot—such, for instance, as William England, and Braun, of Dornach, have produced, with icy pinnacles and crystal glaciers, so bold and life-like that you could almost clamber over them. Imagine Albert Smith telling us again of his evening's sojourn in the hut at the *Grands Mulets*, and then showing us the hovel as it appeared to him—the little wooden shanty wedged between the dark granite rocks, in the middle of eternal snow. We should then have been able to realize in some degree his position, and to understand more vividly the account he had to tell. Or again, fancy that, instead of the sugar-loaf picture he used to show as a representation of his last climb to the summit of the *Mur de la Cote*, he had been able to place before us a sun-picture of the scene, such as has, indeed, recently been produced by Bisson, the well-known French photographer, who has since made two ascents of Mont Blanc. We have only seen this last picture in the stereoscope, mounted upon glass, but we feel sure it would have made something of a sensation had it been exhibited by the late Albert Smith in his entertainment. But photography was only a new art when the versatile lecturer undertook the ascent in 1851, although we doubt not, that had any one made the suggestion, Albert Smith would certainly have carried out the idea. As it was, however, the only photograph which Albert Smith used to allude to, in the course of his lecture, was the well-known picture of Strasburg by night; which showed, as he pointed out, no more than could be seen of the city on a dark night without the lamps alight. But there is no reason why photographic enlargements should not form the *piece de resistance* at a London entertainment, and should there ever arise a follower of Albert Smith, we earnestly recommend him to produce the illustrations of his travels and adventures in this way. Of course, any pictures thus shown must be productions of a

first class order, and displayed in the most brilliant manner by the oxyhydrogen lamp, or some such vivid mode of illumination. Few people who have not seen photographic enlargements projected upon a screen know the full charm of such pictures, which, besides being pleasant and agreeable things to look upon, carry with them the true stamp of reality. Gazing upon photographs of this kind, there is no need to question how far the artist has been honest and conscientious; we see everything exactly as it appears in nature. Thus, on the occasion we speak of, in Paris, there was, we remember, a photograph of a street in Pompeii, showing the whole extent pretty well of the excavations which have been going on in that wonderful place. It was one of the Leon et Levy series; there were the column and courtyards before you, the walls of the ancient edifices, and everything upon the scale of nature. There was no need for examining the picture minutely; everything was bold and defined, so that one felt like one of a group of visitors standing before the ruins in the foreground of the picture. The scene changed, and we found ourselves looking from the jetty of Brest harbour at a man-of-war being tugged out to sea; there was the smoke from the funnel and the foam from the paddles as vivid as reality; one could almost see the two vessels moving, so life-like was the scene. Another change, and we had before us the Square at Rouen, with the statue of Joan of Arc, we ourselves, as it were, being one of the many spectators looking up at the pedestal bearing the Maid of Orleans. In no other form can photography be appreciated so well as in this, where we have nature reproduced, seemingly, in its original condition, and brought before our eyes in all its truth and clearness. Coloured panoramas and painted scenery are all very well in theatres and galleries, but they must necessarily have a lot of romance—or, in other words, untruth—mixed up with them; they serve their purpose, of course, but such things can never be regarded as absolutely true representations of nature. In the case of photographs, however, we do have the truth, and whatever the pictures lack in respect to brilliancy and prettiness, is fully made up by the circumstance that one is looking at facts, not fancies. And there is an inherent love for facts in everybody, from the child who always asks whether it is true, after the recitation of a tale, to the cynic who wants a guarantee from you for the verity of every assertion. Take the case of the Ashantee war as an instance. Supposing some one in London had received pictures from a photographer, or special correspondent, with the expedition, and had prepared transparencies of them for lantern purposes, so that fine enlargements of the country, the roads, the stations, the Prair river, Cape Coast Castle, the natives themselves, of Coomassie, &c., could have been shown in a hall in this metropolis: would not all London have flocked to see them, disregarding at once the wood-cuts and other pictorial illustrations that might exist? Should we not all of us have been eager to see such an exhibition, supposing, of course, the photograph were well executed and interestingly described by a competent lecturer, who would, moreover, have to adopt a light, entertaining manner to render the entertainment lively and interesting? A heavy, lugubrious style would, of course, spoil anything of a popular nature, and the photographs themselves would furnish quite enough of the serious element without the importation of more by a dry, pedantic, though well-meaning lecturer. We hope, therefore, next time that a traveller comes forward to deliver a public lecture or entertainment, he will avail himself of the wonderful assistance which photography can give him in the matter. We believe that a lecture such as Sir Samuel Baker or Captain Burton could deliver, illustrated by lantern photographs, would at once become one of the most popular entertainments in London.

FRENCH CORRESPONDENCE.

FRENCH PHOTOGRAPHIC SOCIETY—MEDALS FOR THE BEST DRY PROCESS AND MOST RAPID DEVELOPER—PERMANENT PRINTING—WET COLLODION WORKING IN THE OPEN AIR—THE BENEVOLENT SOCIETY—CARDIER'S HANDBOOK OF PHOTOGRAPHY.

THE French Photographic Society has recommenced its sittings after the vacation; and, to judge from the communications brought forward, it seems that carbon printing and printing in greasy ink has, during the last few months, completely absorbed the attention of Paris photographers.

The proceedings commenced with a proposition made by M. Davanne to establish a competition for the best dry process, one, namely, which should possess at least the same rapidity as wet collodion, and give as good and sure results, with facility and easy manipulation. A medal of five hundred francs was proposed to be given to the inventor of the method which fulfils the most of these conditions. Not only was this proposition adopted, but, having pointed out the advantages which portraitists would derive from a means of accelerating their work, M. Liebert stated that he had himself resolved to offer, on his own part, a prize of the same value to any investigator who should succeed in solving the problem in development which should admit of giving instantaneous exposures. It need scarcely be said that the offer made by M. Liebert was warmly accepted.

A numerous collection of prints produced by the aid of fatty ink was presented to the Society by MM. Benedict Roze et Chefderville-Deroziers; they were reproductions of sketches, engravings, and manuscripts, obtained by the process of these gentlemen, which they do not claim as their invention, but as having been simplified and rendered practical by themselves, so that prints may be produced by its means at a very cheap rate. They employ bitumen of Judea upon metallic plates, and transfer their impressions to lithographic stones. The prints produced by the method are of a very varied character, and exceedingly successful. There are at Paris just now three large establishments actively working the same kind of process for industrial purposes, and these scarcely suffice for the orders given; they are those of MM. Yves et Baret, Leffan et Lourdel, Roze et Chefderville-Deroziers, without counting the firm of Gillot, who adds this application of photography to his other special work. Again, there is the firm of MM. Thiel and Geymet, who busy themselves with working out the phototype process of their own; the firm of Goupil and Lemercier, who execute work and illustrations for illustrated journals and books by the phototypic process of Woodbury; finally, there are several photo-engraving processes in full working order, to wit, those of MM. Rousselon, Amand Durand, Baldus, Dujardin, &c. It may be said, therefore, that all the processes connected with the art of photography, and which we reviewed a few years ago, are to-day in full operation at Paris. To come back to the last meeting of the Photographic Society of France, we find the carbon processes of MM. Audra et Alfred Chardon represented by some interesting examples, by the side of which a few prints forwarded by the London Autotype Company held a worthy place.

Photochromy, which may be regarded in some degree as an addendum and perfection of all the processes, was also represented in this exhibition of novelties. Those who doubted, a few months ago, the future of photochromy, must to-day acknowledge that it is no longer an uncertainty. M. Leon Vidal exhibited pictures of all kinds: reproductions of paintings, flowers, enameled, and all sorts of articles of vertu, as well as portraits from nature. In all of these the perfection of the process, and the admirable manner in which the form and colour were brought out, were at once apparent. What, however, was more surprising still, was the facility and certainty with which these results are obtained. The method is so prac-

tical, and the daily production at the *Moniteur* office is so considerable, that the administration of that establishment have entered into a treaty with six of the principal Paris photographers to aid in the work, and similar engagements are being entered into with provincial photographers. Beyond their own publications, the *Moniteur* office also produces pictures for other publishers and for the public.

M. Van Tenac exhibited to the Society his instrument for operating in the open air by means of wet collodion, which, while having many points of resemblance with the apparatus usually offered to amateurs, differs, nevertheless, in respect to one ingenious innovation. The camera is a box with a double back, and the hinder part, enclosing the vertical baths, slides in such a way that the collodionized plate may be plunged successively in each of the baths; the latter fill and empty themselves in the simplest manner, and this circumstance constitutes the innovation of which we speak. The bottles, or reservoirs, containing the necessary solutions are placed under the camera, and communicate with the baths by caoutchouc tubes; when it is desired to fill one of the baths, one of the bottles is taken and lifted to a higher position than the bath; you open a little stopcock, and the liquid descends into the bath; you close the tap, and replace the bottle in its frame. After the operation has been performed, the stopcock is opened, and it acts as a waste valve to carry off the liquid again. In this way no accident can happen to the baths.

The Photographic Syndicate has also resumed its labours. As to the Photographic Benevolent Society of France, it has not ceased to carry on its labours most actively. Finally, it may be mentioned that a Photographic Society has been formed at Toulouse. That at Marseilles seems to suffer from the prolonged absence of its founder and secretary, M. Leon Vidal, who is still kept in Paris to organise the practical working of his photochromic process, of which we have spoken above.

There has just been published, by Gauthier Villars, a little volume entitled "Failures in the Practice of Photography—their Cause and Remedy." The work is from the pen of M. V. Cardier, and has already reached its third edition,—good proof of the interest it has created. The author has not only touched upon all the subjects which come within the scope of the photographer, but he has treated them with most remarkable clearness. I can give you the best idea of the value of the work by citing at random a few passages from his book. I quote from a chapter devoted to the testing of chemicals to ascertain their purity.

"*Pyroxyline*, being divided, should not clog together in tufts, nor break into powder. It should be slightly yellow in colour, and should dissolve almost entirely in a mixture of ether and alcohol in equal parts, forming a limpid solution. Moistened with a little water it should neither turn blue, or red, litmus paper placed in contact with it. If, however, any tint of this kind should be produced, the material should be washed in a large quantity of water, and dried once more. It should be kept in a dark place, packed in paper, or in a cardboard box, and not in a stoppered bottle.

"Gun-cotton prepared with acids heated to 50° Cent. furnishes the best results. Prepared with cold liquids it remains in its ordinary condition, white in colour, and in long fibres. In this state it is explosive, and little soluble in ether and alcohol. It furnishes a glutinous collodion of thick consistence, yielding a collodion with waves, and gives rapid images with little intensity. Prepared at 70° Cent. it becomes yellow, pulverulent, and has very short fibres. It dissolves in alcohol to which but little ether has been added, and yields a collodion of very fluid consistence, that gives a powdery film, which is preferable for the dry plate process.

"*Nitrate of silver* furnishes a colourless solution, neutral, or but slightly acid, in character when tested with litmus paper, and not turning red paper blue until a few drops

of ammonia have been added. The solution precipitated by a slight excess of hydrochloric acid, and then filtered and allowed to evaporate completely, should not give a residue of any foreign salts. Fused nitrate of silver is to be preferred for use dissolved in a little distilled water, and evaporated to dryness again, and then dissolved once more at the coolest temperature possible. In this state it is, according to Mr. Hardwich, the most photogenic.

"The sulphate of iron for photography is the protosulphate of the purest kind, of a pale blue tint verging a little towards green. The sulphate of peroxide should be rejected, which is of a dark green, and sometimes of a yellowish exterior. Nevertheless the persulphate may be brought to the condition of protosulphate by heating the solution for an iron developer for an instant with a few drops of sulphuric acid, and with a slight excess of metallic iron in the form of filings, or, better still, new nails.

"Acetic acid, crystallised, when evaporated, should not leave any residue, or even any odour.

"Pyrogallie acid should be white, or, if anything, of a slight rosy tint, completely soluble in alcohol, and leave no ash behind when burnt upon platinum foil.

"Cyanide of potassium should be purchased in a pure fused condition. It should dissolve completely in pure alcohol, and not disengage carbonic acid gas when, in an aqueous solution, dilute nitric acid is added. A crystal of sulphate of iron plunged into a solution of it ought not to produce Prussian blue.

"Hyposulphite of soda should dissolve perfectly and without trouble in distilled water, and in this condition should not be capable of being precipitated by nitrate of baryta."

ERNEST LACAN.

A SIMPLE METHOD OF PRINTING ORNAMENTAL BORDERS, ETC., TO CARBON PICTURES.

BY E. W. FOXLEE.*

WITHIN the last few months M. Lambert has brought prominently before the photographic world a process which he has named the "chromotype." This process consists of developing a carbon or autotype print on a washed collodion plate, and, after attaching the transfer paper and drying, stripping it from the glass as described by Mr. J. A. Spencer some years ago. M. Lambert has also introduced a novelty in the process by masking the picture and printing in the name, &c., of the photographer by a second operation.

New, double printing in silver is a very simple affair, as the image being visible it is easy to adjust the masks in their proper position; but in the case of carbon, where the image is invisible, special means must be taken to secure perfect registration. To secure this M. Lambert has devised a very ingenious pair of printing-frames, or, more correctly speaking, a printing and a tinting-frame, which answers the purpose admirably; but they are cumbersome, complicated, difficult to fit up, and necessarily expensive. They also necessitate the name or design being lithographed on a thin film of gelatine—another somewhat costly affair.

The plan I am about to describe is exceedingly simple, and requires no special appliances beyond the ordinary pressure-frame, and what the photographer can do for himself. In the first place, the writing or design wished for as a border is made on a large—say a "royal"—size sheet of cardboard; then a piece of black paper the shape of the picture is mounted with india-rubber solution upon it in the proper position, and a negative taken of it the size required. The object of using india-rubber solution for the mounting is that by moistening the paper with benzole it may be removed and another shape substituted, so that the same design will do for many different shapes.

Having got a negative, the next thing is to make a transparency of it; and perhaps the best means of doing

this is by printing it on a piece of autotype transparency or dense black tissue, and developing it on glass. Should the transparency not be dense enough, it may be intensified by a solution of permanganate of potash, as described by Mr. J. W. Swan some years ago. Now, having obtained our transparency (or, as we shall call it, a "tinter") we shall require a mask for the portrait negative. This may be made by printing the outline of the negative of the design on silvered paper, and cutting out the centre with a pen-knife. By this means the exact size of the opening will be secured.

This mask should be secured to the negative by a few touches of india-rubber solution, which does not injure the varnish, and allows of its being removed and used on other negatives. To adjust the tinter, place it on the negative, film upwards, and hold it up to the light, when its position is easily seen. It should be so arranged as to slightly overlap the opening of the mask on two sides, so as to produce the light and dark line or shadow according to taste. When adjusted, draw a pencil line on the mask along two of the edges of the tinter—say the top and the left side.

All that is now necessary in printing is to place two edges of the tissue against the pencil lines, and in tinting to see that the same two edges of the tissue coincide with the edges of the tinter. The simplest way to secure this is to push the tinter into an angle of the frame, and then to push the tissue close up to the corner of the frame also. By this means most perfect registration will be secured.

Should it be desired to have a dark design on a light ground—the reverse of that adopted by M. Lambert—it is only necessary to use the original negative of the design, making it, of course, thinner, so that it prints through. In this case the blank out from the mask should be mounted on this tinter to protect the portrait while the border is printing.

A very pretty effect may also be obtained by making the design on a rough, tinted, cut-out mount, backing the opening with white paper, and using the negative taken from this as a tinter. The mount should be illumined with a strong side light when the negative is taken, so as to show the roughness of the mount, and also to produce a strong shadow of the edges of the opening.

HOT WATER FOR CARBON PRINTING, AND A READY MEANS OF OBTAINING IT.

BY JABEZ HUGHES.*

CARBON printing appears now to be entering that interesting period when, by the contributions of practical minds, its difficulties of detail will be conquered, and the best forms of necessary appliances will gradually be discovered. When Mr. J. W. Swan showed that carbon printing was really practical on a commercial scale, and that prints of great beauty could be obtained in permanent materials, his process was too cumbersome and complicated for the ordinary photographer. Mr. Johnson then simplified the working, and, by the further improvements of M. Lambert, the process is at last brought within the reach and capacity of us all. But to the present time no one has furnished the means of supplying a safe, a ready, and an inexpensive means of obtaining a constant supply of the hot water without which the carbon printer cannot work. The trouble and uncertainty of depending on the domestic kettle will soon be discovered, and the conviction will speedily arise that a more convenient means must be devised to secure a supply. In carbon printing it is advisable, for many reasons, that the development of the prints should proceed simultaneously with the printing; a constant supply of hot water is, therefore, wanted all day long. The water need not be very hot, nor is a great quantity needed; but it must always be ready, and there must be the means of regulating the temperature.

It is not at all difficult to arrange a system whereby a self-acting cold water cistern can be attached to a boiler

* Read before the Technical Meeting of the South London Photographic Society.

(having a safety-pipe for the escape of steam), with gas or a coal fire to heat the water, and thus secure a constant supply of hot water. If objection be not raised to the original expense of such an apparatus, and to the cost of fixing and trouble of keeping it going, such a method will certainly secure a constant source of hot water; but I fear that ordinary photographers are not prepared for this addition to their usual plant to qualify them to print in carbon.

During some years of experimental work I have tried various means, such as a tank of water with gas jets under, and other methods; but they have failed, from insufficiency or too great cost. What is exactly required is a constant supply of moderately hot water that can be generated at a moment's notice. The means to secure this supply must be easily fixed in any place where water and gas are available; it must be secure from the risk of explosion, and must occupy very little room; it must be equally available in summer and winter, must not increase cost of insurance, must have no dust, ought to be inexpensive in its original cost, as well as in its maintenance, and must be no more liable to get out of order than an ordinary mechanic can correct.

All these good and necessary qualities, I am happy to say, are to be found in an ingenious invention known as Maughan's "geyser." This instrument is formed of a galvanized iron cylinder, in the interior of which is a compact series of spiral wires. The heat is communicated by a powerful gas burner. The water in passing into this cylinder is diffused by the wires, so that it presents an enormously extended area to the powerful stream of heated air to which it is presented, and it becomes *instantly* heated by the simple act of flowing through. It is only necessary, therefore, to turn on the cold water, light the gas, and a stream of hot water immediately flows from the vessel. By this clever invention any sized stream of cold water can, by the mere act of flowing through the cylinder, be made to rise to the boiling point, according to the capacity of the "geyser" employed. These instruments are made in various sizes to suit the heating power required. As the carbon printer does not require a very high temperature—about 100° Fah. being sufficient—one of the smallest size and the least expensive will be sufficient for the wants of an ordinary photographer, as such a "geyser" will readily supply a stream of water at a temperature of from 120° to 180° in ordinary weather.

In answer to an inquiry, I am informed by the inventor that the cost of thus heating forty gallons of water is three half-pence, the price of gas being 4s. per 1,000 feet. The proof that the heat is thus economically expended is shown by the fact that, while the water is thus powerfully and quickly heated, the vessel through which it flows is not made hot. In this respect this invention differs from other modes of water heating, where the water is accumulated in a reservoir, and is heated by first heating the vessel itself, and through it communicating the heat to the water. In these "geysers" there is no reservoir, and therefore the danger from the accumulation of steam is entirely avoided. To obtain hot water, it is only necessary to turn on the water, light the gas, and the stream of heated water immediately flows, to be continued until a sufficient quantity is obtained. Directly this arrives, the cold water and the gas are shut off, and the stream of hot water, as well as the cost of producing it, immediately ceases.

Since I have abandoned silver printing and worked exclusively in carbon—now three months—I have had one of these instruments in daily use, and have done all my work with it; I am, therefore, thoroughly qualified to speak of its efficiency. I have induced the inventor to bring one of the small "geysers" here for you to see it in use; and, in addition to its being put into immediate operation, every person can examine it for himself when the meeting is concluded.

As you will perceive, it is only about eighteen inches

high and six inches in diameter, and yet it is capable of doing the work of carbon printing for an ordinary establishment, as well as supplying hot water for other purposes. It only requires to be connected with an india-rubber or metal tube to a cold water supply at the top, and a gas supply at the bottom, and it is ready for use. It complies with all the conditions that I have laid down, and I have pleasure in recommending it.

It has never been used, to my knowledge, for carbon printing before; and, as the result of my experience, the inventor will introduce some improvements, so as to make it more perfect for this branch of photographic practice.

SATISFACTION IN LIKENESSES.*

A TEST case of great concern to photographers, and of considerable interest to the public, is before a Brooklyn court. For seventeen successive times a young lady faced the camera. Duly after each successive sitting the photographer sent the evidences of his labour for criticism and possible acceptance. None of the pictures suited. At last the lady declined to sit again, and the gentleman who had originally made the contract—if it can be so called—declined to take any of the pictures, or to pay for anything done. The photographer has brought before the court his seventeen negatives and proofs, doubtless quoting Hamlet, "Look now upon this picture and on this." His labour in preparing them amounts to a certain sum of money, to recover which he has sued. There were the front face, and the side face, and the half-averted gaze; the chin a little more up; the sad look; the faint smile; the expression of being very much pleased—more, in fact, than the lady actually was, and consequently not at all a truthful picture. There were also the standing portrait, and the one with hand up to the head in a position of reflection; the one with the hair drawn back, and the one with it let down; the one with the necklace, the one with the furs, and the one that seemed as if it might have suited with the last new thing of a bonnet. All these the lady, and the gentleman, and all their friends, and now the jury, have contemplated. As Beau Brummell's valet said of the morning's bundle of tried and rejected neckties, "These are our failures."

The defendant replies to all this array of testimony that his agreement "with a tall young man in the rooms" was simply that a portrait would be obtained that should give satisfaction; that failing, nothing was to be paid. The autocrat of the breakfast table has told us how that same requisite of "satisfaction" tortured him with anxiety when lyceum trustees specified it as a condition of his lectures. To promise satisfaction in this part of the country is almost as serious a matter as to demand it further south. So far as photographers are concerned, they have put themselves in the vocative, where they have adopted such a method of doing business as is in evidence. The usual experience is, when a photograph does not suit, another and another attempt is made, till all parties to the transaction are wearied beyond endurance; and at last the sitter, grown desperate, takes what does not really give the coveted satisfaction—takes any of the lot, and usually the worst; on the principle that people who go all through the woods to look for a cane usually put up with a crooked stick. Most persons get into this condition of despair before they have settled themselves for the seventeenth time to gaze at the black cloth, to be asked to throw up the chin and to look smiling. Were human nature not so constituted, the business of photographing likenesses would have to be reorganized, or it could scarcely last a fortnight.

For all that appears in the Brooklyn case, which probably offers a fair specimen of this sort of agreement, if the sitter had been willing to go on with the attempts at getting a likeness, they might have continued indefinitely, till the golden tresses of youth were whitened with the snows of age.

But camera sittings are like the infinite denominators of mathematics; with every new figure obtained, they grow more clumsy. The suit under consideration suggests, however, a new feature in the problem. Suppose a gentleman has made this bargain respecting a lady's portrait. Suppose, also, that the lady becomes tired of the experiment, and putting the sole of her number three flatly on the ground, declares that she will not present herself before the camera again. Photographers, probably, have some rights as well as wrongs. Can they compel the gentleman to find a substitute?

MR. H. G. NEWTON'S EMULSION.

At the October meeting of the Photographic Section of the American Institute, the president, Mr. Newton, gave some further hints on emulsions. He said:

"At our September meeting one or two members complained of fog in their bromide emulsion plates prepared by my formula. As that is not a necessary accompaniment to the process, I was perplexed to account for some of the results said to have been obtained. In my experience I never have foggy plates unless I depart from my regular mode or formula, which, of course, is necessary in experimenting. It is not absolutely necessary that the emulsion should remain until it fogs before adding the chloride. The object in view is to have the emulsion reach the maximum point of sensitiveness before adding the chloride. My first experiments led me to suppose that the emulsion remained in the condition as to sensitiveness in which it was when the action of the free nitrate of silver was arrested.

"If, however, the point of time can be determined when the free nitrate has performed its mission, and the condition of fogging has not been reached, that would be the best time to add the chloride. I will, therefore, give you a formula which will work in twelve hours after adding the chloride, and without fogging: 3 ounces of a 12-grain bromide collodion, fused nitrate of silver 51 grains, finely pulverised and dissolved as before given, in boiling alcohol, and added; after standing six hours, add 6 grains of chloride cobalt dissolved in a small quantity of alcohol. This emulsion will work perfectly clear and brilliant in the time stated after adding the chloride. If desired, the sensitiveness of this emulsion may be increased by adding 6 grains of nitrate of silver to the 3 ounces, forty-eight hours after making it. This reduced the amount of free chloride to about $\frac{1}{2}$ grains.

"Whether this emulsion, with such a small quantity of free chloride, will keep as long as it would if the silver was not added, of course time only can determine. That which I prepared in this way was perfectly good after it was three weeks old. There is quite a popular idea among dry-plate workers that anything almost will answer for a preservative. That is true to a much greater extent with bath plates than with emulsion, especially so with plates prepared with emulsion made by the addition of chloride. I have been over the ground in this department very thoroughly. A little variation of even the quantity of ingredients will destroy the plate; nevertheless, when the proper ingredients and proportions are once determined, there is no process more sure or uniform in results. The best preservative which I have used is composed of water 12 ounces; tincture of nux vomica, 1 drachm; syrup of squills, 1 drachm; laudanum, 1 drachm. This, for either wet or dry, will give very sensitive plates, and brilliant negatives."

The secretary said, "that speaking of fogging recalled some experiments which he had made since the last meeting. His chemical room is a very large one, and in his window he had orange and green glasses. In making some alterations in the room, he concluded to change the glass in the window. The yellow glass he had relied upon he found did not perfectly obstruct the actinic light; he therefore used ruby and green, which proved perfectly non-actinic, but the sensitized plates required a longer exposure in the

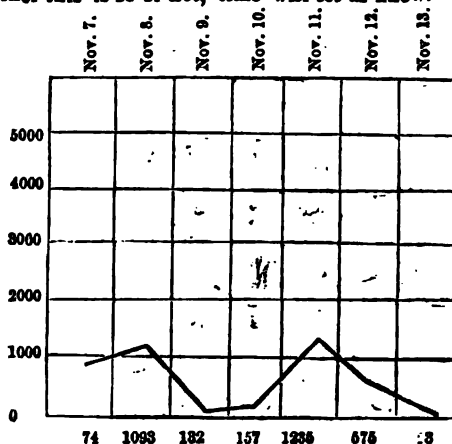
camera. He would, therefore, suggest the use of green outside of the ruby."

METEOROLOGICAL REPORT SHOWING THE VARIATIONS IN THE DAILY AGGREGATE OF CHEMICAL FORCE IN THE DAYLIGHT OF THE SOUTHERN SKY,

FROM OBSERVATIONS MADE AT BLACKPOOL, IN LANCASHIRE, BY D. WINSTANLEY, F.R.A.S.

THE very dark season is now in all probability drawing to a close, although the last day of the past week has been astonishingly dark, being far lower than I should have conceived possible here, the aggregate amount of light during the day in question having been only 23 chemical units. The total amount of light during the week has been 4189 units, and the daily average 598, or 257 more than the daily average of the preceding week. Four days of the past week give again the peculiar linear conformation which, being drawn on a wider scale (the present $\times 5$) yields a line through whose fiducial points a portion of a circular curve will pass. I do not say definitely that the circumstance proves anything, although it certainly is suggestive of the operation of some precise and definite law. I have made a series of "chance" diagrams extending over a larger set of numbers than the whole of my chemical reports, but without once arriving at that curious line which has several times occurred in the chemical reports,—a circumstance strongly indicating the nonfortuitous origin of the line. The "chance" diagrams, indeed, differ altogether in their general appearance from the diagrams of the light, a sort of a distorted letter W being a frequent characteristic of the former, and an almost absent figure from the latter; nor is this a matter for surprise, as in the "chance" diagram, when a number is obtained decidedly below the average line, the probability is in favour of the next one being above it, or at any rate above the one already marked, which circumstance, recurring twice, gives us a sort of letter W, the characteristic of the diagram made by chance.

The abnormal darkness of the present season of the year is suggestive of the following explanation. In the summer season the northern hemisphere receives a larger share of solar heat than is that which falls upon its Southern neighbour, an excess which gradually sinks down to nought on the approach of the autumnal equinox, when the maximum slowly changes to the southern side. If we assume—as to me appears in some wise probable—that the cooling of the earth by radiation occupies some few weeks of time, the vesicular condensation taking place by night will at its normal rate exceed the solar dissipation taking place by day, and fogs and clouds would form the normal state of things. On this theory, the spring time of the year should as much exceed the mean between the summer and the winter brightness as the autumn falls below it. Whether this is so or not, time will let us know.



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THE SOUTH LONDON TECHNICAL MEETING.

THE South London meeting of this year proved an unquestionable success. A crowded assembly of photographers from all parts of the country listened for three hours with unflagging interest to the explanations of upwards of a score of technical appliances, new and old, for aiding their daily work, every one of which required for its full appreciation some personal examination rather than a written description such as could be given in journalistic reports or trade advertisements. Every photographer knows how much more perfect an understanding can be obtained of many contrivances by a glance of a few moments, accompanied by the freedom of colloquial comments, than can be derived from the most careful and accurately written description. The tendency to undue discussion was on this occasion kept under. Nothing is more natural than the tendency, when a questionable novelty is introduced, especially if protected by patent or other restrictive claims, to question the soundness of the claims altogether. When a burnisher with new claims was introduced, the enquiry of Mr. Hart, in the interests of photographers at large, as to the real basis of the patent rights in this or other existing burnishers, was natural and legitimate enough; but it is clear that the answer of the President, that such enquiries were beyond the province of the meeting, and should be referred to a patent lawyer, was the only course which could with propriety be pursued, as such an enquiry might have occupied half the time devoted to the meeting, without settling anything; whilst it must inevitably have shelved, for lack of time, half the interesting matters before the meeting. The trade element was most judiciously kept under. It is manifest that many interesting novelties, even when exhibited manifestly in trade interests, possess an interest not less important to photographers who are anxious to see the practical operation of appliances of value which such an occasion alone can efficiently afford; and on this occasion it was the interest of the worker, and not that of the trader, which was obviously kept under attention: the "Geyser" appliance, for rapidly and economically obtaining hot water, introduced, on behalf of the inventor, and certainly for the advantage of photographers, by Mr. Hughes, affording a notable example. And an admirable element in the success of the meeting was this time found in the apt questions of an intelligent interrogator in the person of Mr. Preston, of Penzance, who, by terse queries not involving discussion, repeatedly elicited fuller information on points which were of essential value to the meeting.

In some few cases a tendency to redundant and circumlocutory verbiage still remains to be eliminated. In many cases the brief, practical, and clear style of the exhibiting speakers was most admirable. We may quote, as an

example or two: Mr. W. T. Wilkinson, in exhibiting Mr. Burton's admirable swing bath of wood, when asked how the wood was coated to protect it from the silver solution, avoided the temptation to enumerate the various substances which might be used, but replied tersely, "Bates' black varnish, applied thin and often." Mr. Foxlee, in showing an admirably simple and efficient substitute for the cameo embossing press, held in his hand three trivial things: a piece of plate glass, a zinc shape with oval aperture, and the glass stopper of a bottle. Placing the zinc shape on the glass, and a card portrait on the shape, he rubbed down the back of the card into the aperture of the shape, and in a few seconds passed round to the audience the card with a perfectly embossed cameo relief, remarking that a piece of paper placed at the back of the card prevented any appearance of marks of the glass stopper burnisher. The demonstration and explanation did not occupy three minutes, and furnished a valuable aid to practice which any photographer himself could always readily improvise.

Some few subjects might have afforded subjects for legitimate discussion had time permitted, but the temptation was fortunately avoided. Col. Stuart Wortley exhibited a series of very fine, large, and apparently instantaneous subjects, consisting of sea and clouds, the negatives of which, it was announced, were produced in a bath consisting of equal parts of nitrate of silver and nitrate of uranium, which suggested that, as directly contradictory results had been obtained by some capable and trustworthy experimentalists, there are yet conditions to be ascertained, and that the *dernier mot* on the subject has not yet been said. The proposal to recover the whole of the silver from waste developing solutions and old hypo baths, by filtering them through felt and sawdust, manifestly requires further verification. The silver in waste developing solution, being in contact with a reducing agent, will, in a great measure, be doubtless precipitated; but as traces of silver in such solutions may be found after standing many days, it is doubtful whether the application of a chloride to the escaping water would not discover that some traces of silver were still lost. In relation to the hyposulphite fixing solution, the doubt is still greater: as sawdust is not recognized as an efficient aid in decomposing and precipitating the solution of hyposulphite of silver, it is more than probable that the application of liver of sulphur would discover that silver remained in the efflux after filtration. Further experiment and intelligent discussion will doubtless throw light on the subject, and the jelly bag and sawdust, with the aid of reducing agents, will probably prove of great value.

INDIVIDUALITY AND TRUTH IN PORTRAITURE

THE sitter, or rather sitters—for the intended picture was a group of two—alluded to in our last as having raised the question as to the right of photographers to demand payment for unsatisfactory portraits, were probably the most unreasonable of the (happily) small and select class, with whom every portraitist is familiar, who are dissatisfied with everything,—with the arrangements of the operator, with the picture produced, and, most of all, with the necessity of paying for work done. The couple forming the group in question, sitting to Mr. Frank E. Pearsall, of Brooklyn, a portraitist of good reputation, having had seventeen negatives taken, and expressed dissatisfaction with all, declined to sit any more, declined to accept any of the portraits produced, and declined to pay for the work done! An appeal to a court of law was the only resource; and judgment being reserved, photographers in the United States await it with some interest.

A little reflection on the conditions of photographic portraiture will suggest the wonder rather that the photograph is so frequently a successful and satisfactory likeness, than that it occasionally fails. The sitter is placed in a

series of conditions all new and strange. The glass-room, with its flood of light and surroundings; the arrangement and manipulation which are generally thought necessary; the self-consciousness and anxiety which fill the mind at the critical moment,—all tend to induce a constrained and unnatural expression. Despite these inevitable difficulties, often made greater than is necessary by the fussy want of tact in some portraitists, photographic portraits are, as a rule, wonderfully faithful in general likeness, and possess when not spoiled by excessive retouching, a singular individuality. "There is," says Nathaniel Hawthorne, "a wonderful insight in heaven's broad and simple sunshine. While we give it credit for only depicting the merest surface, it actually brings out the secret character with a truth no painter ever would venture upon, even could he detect it." A recent article in the *Saturday Review*, on the "Art of Appearing Like a Fool with Propriety," has some excellent and appreciative remarks on this subject. The writer conceives that there is "no undertaking more trying to the average dignity and self-respect, at least of the male portion of the human race, and of no process more calculated to puzzle those who like to trace some connection between results and the means employed to produce them, than that of going in cool blood to have one's photographic portrait taken. Certainly photographic portraits, as now taken by skilful operators, are a very pleasing thing, and not less surprising than pleasing. They are often attractive, on account of the obvious delicacy and fidelity of the workmanship, and the evidences they afford of the manipulation of trained hands. But their attractiveness is by no means of this kind only. They are often very complete expressions of the character of the subject, which they present with simplicity and refinement. We have before us at this moment the portrait of an old gentleman, an artist, which is exquisitely true to a nature of the rarest purity and grace. The gentleness; the elevation of a mind wholly given over to the contemplation of the beautiful and the pursuit of a difficult and lofty art; the strength of an enthusiastic spirit; the animation flowing from a native shrewdness, keen sense of humour, a lively sympathy with human feeling, and a spice of vigorous but controlled combativeness,—all these are in the picture, as well as the minute markings in the face of old age, the beauty of a snow-white beard, and the dignified carriage of a form broken with years and suffering, but sustained by a firm will. The gallery of the gentleman who produced this portrait is full of pictures of equal interest, and very varied in character.

"What inspires with wonder the observer who ascends to the operator's room is, how all this array of vivacious and expressive faces was turned out by the apparently barren and incongruous machinery of that illuminated den. The torn and rickety reflecting screens, the dingy velvet chairs, the rocks of wood and paper worn by the stream of human forms ('a continual dropping that weareth away a real stone'), the abominable racks and grips of iron,—all these inspire one with a horrible sense of artificiality and arrangement entirely incompatible with freshness, or ease, or grace, or naturalness. This feeling is intensified when the observer is fairly 'posed,' his head twisted as it was never twisted before, unless by the photographer's merciless hands, and as it would never remain were it not for the iron griffin that holds him in its unfeeling grasp, his eyes directed to a fixed point, and his whole system rebelling against the silent, rigid, despotic disposition of himself to which he has submitted. The skilful artist, with an occult purpose which one feels is doomed to disappointment, bids you to give your countenance a 'little more animation.' You grin in a ghastly way at the suggestion, when your sense of mortification at the figure you know you are making is broken in upon by your tormentor, who tells you, with a comprehensive gesture: 'That's it precisely! Now let that dissipate into a genial smile, and I'll give you a good one.' Mentally you remark

that if he does give you 'a good one' it will wear an expression of mingled idiocy and rage.

"Yet the chances are nine in ten, if your photographer is amongst the best, that he will produce for you a portrait in which your friends will find a dozen different phases of your character. His experienced eye perceives the means of reaching the effect he is in pursuit of in arrangements that your uneasy consciousness condemns, and against which your pride rebels. Perhaps a rational man ought to be a little rebuked, a little touched with humiliation, at the reflection that he knows so very little about how he really looks. The conviction that one was really appearing with as much dignity and grace as were natural to him, when he felt that he was looking constrained and silly, suggests the awful possibility that when one appears to his inward eye all that he desires, he may be the very reverse to the impartial observer."

SENSITIVE NEGATIVE TISSUE.

BY L. WARNERKE.*

SENSITIVE negative tissue has for object to offer a substitute for glass in the production of negatives, presenting the advantage of facilitating all operations out of the studio, by lightening the weight, diminishing the volume, facilitating transport. All these advantages, coupled with perfect safety against breakage, abrasion, and atmospheric influences, augur unlimited keeping properties of the tissue.

The tissue is prepared on a sheet of paper, possessing a very fine texture, through the application of nine consecutive coatings of collodion and india-rubber. The transparent film thus formed can be detached with the greatest ease from the paper, which is used only as a temporary support. The sensitive surface is formed with bromo-iodized collodion or gelatine emulsion.

The sensitive tissue thus prepared on the sheet of paper (16in. by 10in.) is cut in the smaller sizes to fit the various photographic apparatus. Twelve sheets of a certain size, interleaved with orange tissue paper, are formed into a block, protected on both sides with metallic plates, while the edges are secured with paper or india-rubber. In this condition the tissue inserted in the block is perfectly protected from the action of light and moisture (it can be with impunity dipped in the water). The thickness of the block of twelve sheets does not exceed the thickness of the ordinary glass plate. It can be carried without other protection in the pocket, or be sent by post like an ordinary letter.

For exposure, the front metallic plate is removed, orange paper torn away, and the block, with first sensitive sheet uncovered, is inserted in the dark slide like an ordinary glass plate.

Yet in the shape of blocks the advantages of the sensitive tissue are not utilized to their full extent. To change the sheet after exposure, the dark tent, or some other arrangement, is necessary, but that implies considerable inconvenience. The roller dark slide overcomes this last difficulty. The sensitive tissue, with supporting paper or without it, is wound on the roller, and changing is effected by turning the brass button. Means to secure the flat surface corresponding with the ground focussing glass, and exact position of each portion of the sensitive band, are provided.

Exposure.—The exposure of the sensitive film is at present equal to the best dry plates existing. I have to make a very important observation, applicable, more or less, to all dry collodion, viz.: increase of exposure, necessitated by decrease of actinic intensity of light, does not follow the same rule for dry collodion films as for wet. If actinic intensity, decreasing toward the evening, necessitates for wet plates an exposure of one, two, three, &c., seconds, for dry plates it will be necessary to give, perhaps,

* Read before the South London Technical Meeting.

one, three, six, twelve, &c., seconds. It follows that the very same dry plate can be of equal sensitiveness with wet on a bright day or in June, while a different story will be told in November, or on a foggy day.

Complaints, comparatively general, of want of detail in the foliage, with solarization of brightly illuminated objects, are supports of my opinion. Based on this consideration, on a gloomy day in November I must recommend a long exposure, and, as a reward, I promise a result superior to the glass plate, because when, by long exposure, sufficient details in the dark part are secured, brightly illuminated objects will not suffer—reflecting surface being absent. The negative I developed before this audience is a very good illustration of the correctness of my promise. It was taken yesterday during continual rain, and represents the interior of my drawing room, which is comparatively dark. Exposure of forty-five minutes overcomes the difficulty of the dark; but there is in front a window with open sky, that requires less seconds for exposure than was given minutes, and, nevertheless, no trace of blurring or solarization is observable. But while in the summer I praised the sensitiveness of the tissue, I dare not compare it now to the wet collodion.

After exposure in the camera in the case of the block, the exposed sheet is detached, the next uncovered, and similarly treated. The exposed sheet, preserved from light, can be developed any time after exposure; in fact, I could not observe any difference between the negative developed immediately after exposure, and another after several months had elapsed before the development.

Development.—Development can be executed in two different ways:—

1. The film is separated from the supporting paper. To effect this a pin is inserted between the film and the paper, at one of the corners, and passed round the edges; then, taking it by one of the detached corners, the film is carefully peeled off. A glass plate same size as the film, with a little water dropped on it, is now required, on which the film is laid, and slightly pressed with blotting-paper to make it perfectly smooth and flat. A moderate amount of pressure may be used with safety, and there is no danger of injuring the negative in handling it before, during, or after developing, provided the hands are perfectly free from grease, chemicals, and perspiration.

2. The sensitive tissue can also be developed while still attached to the paper supporting it. In this case the edges are bent to form a shallow dish, and development proceeded with as will be described; but before the film (after fixing) is detached it must be perfectly dry, otherwise the paper will not leave the film clean.

In order to make the process of development still more easy, and almost possible to execute in white gloves, I designed a little spring dish formed of a light frame in ebonite, which, when applied to the glass plate and fixed by means of brass clamps, form a perfectly watertight dish. It is evident that if a sheet of tissue is laid on the glass plate, the ebonite frame put on it and clamped, it will form the bottom of the dish. All the developing and washing solutions can be applied without the danger of spilling a single drop outside, on the hands, or at the back of the tissue. (I imagine that the use of this dish for fixing the photograph on the albumenized paper would add to its stability, preventing sinking of the dangerous compound in the body of the paper by uselessly applying hyposulphite of soda solution to both sides of the paper, from which it cannot be easily eliminated.)

I cannot offer a universal formula for development. Every sample of sensitive emulsion requires a different formula for developer adapted especially to it. With the present imperfect knowledge of the chemical reactions attending the manufacture of the sensitive emulsion, no operator can produce two samples of emulsion exactly equal. But when the strictest observation of certain rules cannot secure uniformity in the quality

of the emulsion, there is some possibility of re-adjusting, to a certain point, the difference by using a suitable developer. I adopted in turn the strong and weak alkaline, iron, and acid pyrogallic acid developer; but with the sample I developed before this audience the developer differs from the formula adopted by dry plate workers, and is there described.

Before proceeding to develop the exposed sheet of tissue, a solution of—

Alcohol (methylated)	...	...	10 parts
Benzine (pure)	...	...	1 part

is applied, and returned to the bottle for future use. The tissue is next washed with water till all greasiness disappears; then—

Carbonate of potash	...	...	1 ounce
Water	...	...	10 ounces

is applied, and also returned to the bottle; then a solution of—

60-grain pyrogallic acid in alcohol	...	10 minims
80-grain bromide of potassium	...	20 "
Water	...	2 drachms

is applied, and will bring out the image. A few drops more of pyrogallic acid are added, if necessary, to increase intensity, or bromide to regulate too rapid development.

Remarks on the India-rubber.—The use of benzine in alcohol is intended to render the collodion film accessible to the aqueous solutions forming the developer. With dry plates alcohol alone is sufficient to perform that duty; but in the case of tissue, where the thick india-rubber is underlying the sensitive collodion, very often spots make their appearance in the development. While investigating the cause of these spots, I came to the conclusion that they were occasioned by the india-rubber. Several correspondents in our excellent photographic journals on more than one occasion have complained of these spots. Captain Abney, in his last book, likewise observes that india-rubber substratum occasions spots visible in the development.

My theory of the cause of spots is the following:—I suppose that india-rubber, like albumen, or like honeycomb, is formed from cells containing some liquid inside. In the usual process of preparing india-rubber solution the component parts of cells are not separated from the liquid portions; what we call india-rubber solution is, in reality, an emulsion in which some cells are floating unbroken. After the application of collodion to the surface of india-rubber, the collodion film, while drying, in the process of contracting squeezes the unbroken cells, the liquid rubber comes out, penetrates the collodion film, and makes in that place a perfect mackintosh, inaccessible to the action of aqueous developing solutions. It is evident that this will make a round transparent spot in the negative, and, in reality, this is the characteristic aspect of the spots.

I verified my theory by actual experiment. On the ordinary dry collodion plate india-rubber was applied, the film transferred, and developer applied from the glass side; but it resisted the action of the developer where it was penetrated by india-rubber. Since my theory became an axiom, the remedy was self-evident, and is twofold: (1) the use of rubber solution free from cells, and (2) application of benzine before development, in order to liberate the collodion film from the grasp of rubber, and thus render it accessible to the developing solution. Further investigation proved that application of the benzine-alcohol solution has a still wider field of beneficial action—it remarkably facilitates the development, and aids in obtaining intensity. I am almost inclined to say that with washed emulsion, in the absence of a body readily absorbing the iodine liberated by the action of light from iodide of silver, benzine performs the duty of iodine absorber.

Solution free from cells I prepare in the following manner:—A fresh piece of india-rubber, white in colour,

is separated into thin sheets, and immersed in benzole, where it has to remain for two or three days *undisturbed*. After this time a considerable portion will be found dissolved in benzole. The thick liquid is carefully decanted, and preserved for use. It is perfectly transparent and colourless. The remaining pieces of rubber are swelled to almost twenty times the original size, and can be, with a fresh portion of benzole, aided by heat and agitation, transformed into an excellent emulsion, suitable for mounting or other purposes. I employ it for the formation of the tissue, but I am careful to use for the last substratum only the first decanted portion.

India-rubber has often been condemned for its property of transforming into a brittle, powdery gum by exposure to air and light. But who knows whether the disturbing element is not confined to the cell-composing part only? In my comparatively short experiments I have already observed that cell-emulsion becomes brown by keeping, while the first-decanted solution is still free from colour.

Fixing is executed with a solution of—

Potassium cyanide	...	...	1 ounce
Water	...	...	10 ounces
or Soda hyposulphite	...	...	1 ounce
Water	...	...	8 ounces

In cases where intensification is needful, it can be done either before or after fixing. The following, after Colonel Wortley's formulæ, is advisable:—

C.—Citric acid	...	...	4 grains
Water	...	...	1 ounce
S.—Nitrate of silver	...	...	15 grains
Nitric acid	...	...	5 minims
Water	...	...	1 ounce
P.—Pyrogallie acid	...	...	96 grains
Alcohol	...	...	1 ounce

After fixing and well washing, cover the plate with sufficient of C, and pour on and off two or three times; then add ten minims each of S and P to each drachm of C, which will quickly intensify the plate. All traces of the pyrogallie acid must be carefully washed from the film (both sides); acetic acid diluted with water is recommended for this purpose. When the negative is finished, it can be dried on the glass that has been used as temporary support during development, or inserted between sheets of blotting-paper, and dried under pressure. For printing, the film is attached to a glass plate by means of friction from a squeegee, but if this does not give sufficient adhesion, a few drops of water between the glass and the film will be all that is necessary.

The varnishing can be executed with chloroform-amber or dammar-benzine varnish, but this is not absolutely necessary. If varnish is applied on the paper side of the film it will render it transparent; while otherwise, from the impression of paper texture, it is like finest ground glass, which is not, however, objectionable, but rather the reverse.

HOW TO AVOID SOME TROUBLES.

BY A. M. DE SILVA.*

I HAVE tried every method prescribed—the moderate, the fancy, the desperate—for the curing of a disorganized bath, but I have found the following the simplest and surest of them all, and by far the most economical. I do not neutralize my baths previous to boiling; I simply evaporate them to dryness, thus getting rid of the acid. Dissolve the product in a little water, and then pour that into about as much water as you think will reduce it to the strength you work it at; filter out the precipitate; set in the sun in a clean bottle with a cover on for a day or two, when, after filtration and acidifying, it is ready to work. After it has been served this way twice, turn it over to the printer, or, better, the refiner; a much be-doctored bath is a very

* *Anthony's Photographic Bulletin.*

unreliable companion. Never add anything to the bath which you can possibly avoid, for, although it might prove beneficial at the moment, it will afterwards often prove very troublesome. Were some of our expert chemists to carefully analyze an old bath, the results of their experiments would startle not a few.

Those streaks! But why have them? Make this a rule, and see how very much trouble and vexation of spirit it will save you: as soon as you "get through," of an evening, take out the dipper from your bath and wash it (as I presume every tidy operator does); cover your bath with something which will allow the escape of ether and alcohol, and, at the same time, keep out the dust. In the morning, on looking at your bath, you will observe the surface covered with—well, in order to be simple and avoid chemical terms, I will call it "scum," which requires to be taken off. Do not plunge your dipper in, and think that, by "mixing it up," you are going to "make it all right;" but first take a piece of clean filter paper and gently skim it off; then take another piece, and perform the same operation; finally, take a plate coated with collodion, and, holding it in your hand, gently work that all over the surface of your bath until the floating matter has adhered to the collodion film. Now you may place your clean dipper in the bath and commence work without any fear of those streaks in the direction of the dip "which work off after a few plates," from the fact that you have removed the cause, this "scum" being gradually taken up by the films as the plates enter the bath. The operation is performed in five minutes.

Buy your collodion; you will find it more economical in the end. Manufacturers of collodion possess advantages which no individual has. There are so many reliable samples in the market that you cannot well go wrong. The bath is often blamed when the collodion is at fault.

Carefully wipe out your plate-holder after every plate—many think glass corners a preventive of dirty markings—and not only drain your plates, but wipe the backs before putting them into your dark slide; it saves silver. Also occasionally wipe out your camera with a damp rag; do not "distribute the dust" (as "Fanny Fern" happily has it) with a dusting brush, thus avoiding "mechanical" pinholes. Keep all things clean and tidy, not forgetting your hands, your floor, and shelves, and you will save yourself many disappointments. One good, clean negative is worth a host of poor ones. Stopping out occupies much time.

Learn how to be right; then reserve to yourself some opinion about your work. Make it a rule that part, if not all, be paid in advance; and if sitters are capricious (and you are right), let them pay for their peculiarities—they will think more of you in the long run.

Last, but by no means least, politeness goes a long way—it overawes the rough, is appreciated by the polite, and, while it costs nothing, it gives an infinite amount of pleasure to one's self and everybody else.

I am indebted to Mr. Henry Anthony for a very valuable "wrinkle": the addition of two—but I have used from three to four—drops of glacial acetic acid to the ounce of collodion in hot weather. To those photographers (landscape especially) who are troubled in hot weather with their pictures flashing out, I would most strongly advise a trial of this simple, but very excellent, controller. Mr. Anthony advises the addition to be made but to sufficient collodion for the day's work.

Correspondence.

PHOTO-COLLOGRAPHIC PRINTING.

SIR,—I read in two recent numbers of the *Photographic News* that a gentleman had essayed photo-mechanical printing without success. As far as I can understand:

1. He employed Nelson's gelatine, which may be very

unsuitable for some purposes, and is not suitable for this process. I have tried it, and found it of no good, my gelatinized paper being wadded. What is wanted is *gummy*—not *gelling*, such as that used for *water*—*disposition* not refused by acid.

2. He put nitramine into his gelatine bath, while the gelatine paper should only be nitrated on the surface.

3. He exposed the back of the image, which prevented its adhering to the glass.

4. He began by inking with a lithographic roller, whereas he should have commenced by inking lightly with the finger.

5. He employed a lithographic roller of gelatine instead of one of leather.

This is why he has not been successful.—I am, &c.,

ROBERT LAMBERT.

Aux Forges de Bonne, Loire, Loire Inférieure, Nov. 9.

Proceedings of Societies.

SOUTH LONDON TECHNICAL EXHIBITION.

THE annual meeting devoted by the South London Society to the exhibition and explanation of subjects and processes essentially connected with the technique of photography was held in the large hall of the Society of Arts on the evening of Thursday, the 11th instant. The Rev. F. F. STATHAM, M.A., presided, whilst Mr. JAMES HUGHES undertook the duty of general expounder. A large attendance of photographers was present, including many from all parts of the country, as well as members. Some necessary preliminary business of the Society—such as reading minutes, nominating officers for election at the annual meeting, &c.—having been transacted,

The CHAIRMAN offered a welcome to visitors, and explained the purport of the meeting, which was to exhibit and explain, but not to enter into lengthened discussion. He was followed by Mr. HUGHES, who further deprecated the natural tendency to discussion which might arise out of explanations, pointing out that unless discussion were used in this way, not half the matter prepared could be brought before the meeting. He added that everything like trade advertising should be avoided, although necessary explanations must unavoidably at times bring in a trade element, which should, however, be incidental rather than the main purpose of anything brought forward.

We may explain here that a report of such a meeting must necessarily be held and incomplete, as the verbal explanation of various objects exhibited can only be briefly mentioned in a report.

Mr. TAYLOR exhibited a modified burner made by Mr. Cleary, which appeared to be a slight modification of the Weston burner and the Entenkin burner. It could be arranged to act as a stationary burner like the first, or as an oscillating burner like the second, and was provided with an atmospheric burner for heating the burner by gas.

Mr. HART asked what was the point protected by patent in these burners. He asked in the interests of photographers generally, who were threatened with pains and penalties if they used an unpatented burner, and he had in his possession a burner of some or kind made in England twenty years ago.

The CHAIRMAN said the meeting could not enter into that discussion. The question was one for a patent lawyer.

Mr. W. BOWLES explained and exhibited his mode of masking, brought before the Society at the June meeting, showing a charming print produced by the treatment from a feeble negative.

Mr. FOXLER read a paper on "A Simple Method of Printing Ornamental Borders on Carbon Prints," and exhibited the mode of working (see p. 357). A brief discussion followed on the respective advantages of this method of using lithographic stones, and of producing the ornamental border in the camera, and

Mr. FRANK HOWARD suggested a plan of securing registration by the use of bisecting lines on the back of the image and negative.

Mr. FOXLER then exhibited a very simple substitute for a camera embracing prism. It consisted of a zinc shape with oval aperture, which was placed on a piece of glass; the mounted print being then laid in position upon it, was simply rubbed into

the shape with the glass stopper of a bottle. The exhibition of this simple contrivance was greeted with much applause.

Mr. FOXLER also called attention to a very fine series of instantaneous views of large size (12 by 18), printed on Mon. Lambert's tissue from negatives by Cal. Stuart Wootley, produced by the aid of a bath containing equal parts of nitrate of silver and nitrate of uranium.

Mr. WILKINSON exhibited a filtering paper, folded into what is well known amongst operative chemists as the phial filter, forming something like a conical flask, adding, that if the apex of the inverted cone got broken or weak, he tied a piece of cotton wool round it. He also described a mode of constructing a method of filtering solution without compression, using a couple of bottles, bungs, and some tubing.

Mr. TAYLOR showed one of Mr. Wootley's chrysotypes. It consists of one of the Wootley-type films suspended upon a support in which various masses of colour to suit the subject have been printed by means of chromo-lithography, the transparent photograph being placed over the rough masses of colour, giving the effect of a painting, somewhat in the fashion that a silver print made transparent and roughly coloured at the back gives the effect of a finished picture. Mr. Taylor also exhibited a diaphragm contrived by Mr. Wootley to give a motion to the lens somewhat equivalent to a swing-back. Mr. Taylor also exhibited a model of a tank sliding up after the manner of an umbrella, sent by a photographer in the country, and a useful note-book, arranged for keeping memoranda of the conditions of exposure, &c., of a series of plates when out on a landscape excursion. The note-book was contrived by Captain Fox.

Mr. W. T. WILKINSON exhibited an ingenious contrivance of clips to fish up plates which may have slipped from the dipper into the bath. He exhibited also Mr. H. J. Burton's swing bath, and explained, in answer to a question, that the bath was treated inside with Bate's black varnish applied thin and often. He also exhibited an actinometer made by Mr. Burton, chiefly to show the intense black which might be obtained by means of an intensifier, details of which might be found in the YEAR-BOOK OF PHOTOGRAPHY for 1873, p. 57. The plate exhibited was of an even intense black, and quite opaque.

Mr. WILKINSON exhibited a simple and ingenious frame for aiding in copying, either by reflected or transmitted light. The frame was light and simple, having various adjustments and movements, and a groove for the front of a camera carrying the lens to be placed in. When copying prints, a sheet of tissue paper was thrown over the frame, which admitted a soft light, falling on the print equally from all directions, and so preventing the granular effect so common in such copies. When used for transparency work, the tissue paper was replaced with black cloth or velvet.

Mr. R. H. FRANKTON asked if the use of the tissue paper was a theoretical idea, or had been verified in practice.

Mr. HUGHES said he had the frame in use for two or three years, and found it most valuable. He felt even now some regret that it was given to the public, because the result of the tissue paper being so perfect, it placed a great power in the hands of the painter.

This remark was greeted with cheers and laughter.

Mr. HUGHES exhibited a modification of the French easel, which was found useful for supporting plates in enlarging, when the dark room was practically made into the camera. He showed the various adjustments, and the power which placing the plate out of the upright had of correcting distortion in an original. In the course of some discussion.

Mr. FRANK HOWARD said it might be useful to amateurs, who only occasionally required such a thing, to know that the domestic clothes horse might be arranged to answer very well.

Mr. HUGHES exhibited a model of Brewster's stove, and described its operation in securing a constant supply of fresh warm air into an apartment, on the same principle as that of George's Calatrava. In the course of the conversational discussion which followed.

Mr. FRANKTON referred to the advantages of Gurney's patent stove, which was provided with a means of supplying moisture as well as heat, and by the extent of radiating surface, utilized all the heat produced.

Mr. NISBET explained a method of saving anxiety and watching every exposure. He put an ink mark on his watch-glass, and when commencing exposure, placed it at the part of the dial indicating the amount of exposure to be given.

Mr. HUGHES had employed a similar plan many years ago; but he put the mark at the point where exposure commenced, and measured from there. Having by some chance got a watch-glass that fit tight, and did not move, he had got out of the habit of using it, although he had found it very useful.

Mr. HUGHES exhibited and explained the use of Manghan's Geyser, for supplying hot water in a few minutes, which in carbon working was of great importance (see p. 555). In answer to a question, he said Mr. Werge would supply the arrangement to photographers.

Herr WARNEKE explained his sensitive collodion tissue to the meeting, and gave a demonstration of the mode of development (see page 559).

Mr. FRY described a plan of saving silver, based upon the American dodge of using an old felt hat. He used seed pans such as were employed in gardening operations. A bag of felt carpeting was made to fit the pan, and this was filled with sawdust. In developing, the waste solutions were permitted to run into the pan where the silver was thrown down, and the water filtered away. He used a box with sawdust for hypo, and he thought in filtering through he got all the silver left in the sawdust.

Mr. PRESTON said a jelly-bag answered admirably; and Mr. Hart added that jelly bags could be had of any size, an excellent one for photographic use costing 7s. 6d.

A MEMBER said that he used an old felt hat, and some sawdust, at the bottom of the waste pipe.

Mr. BAYNHAM JONES exhibited an ingenious camera, in which the dark slide had a movement equivalent to a spring back.

The CHAIRMAN read a communication from Mr. Winstanley, describing the principle of the actinic records which were appearing weekly in the PHOTOGRAPHIC NEWS.

Mr. BRITTELBANK showed a small printing press, by which photographers could do their own letter-press printing.

Various other matters were exhibited without explanation, such as examples of Dallastint, Weymouth's vignetting paper, &c.

The meeting was continued with interest until a late hour, and finally concluded without the usual votes of thanks to chairman and contributors, the absorbing interest of the proceedings causing oblivion of the usual formalities.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL meeting of this Society was held on the 11th inst., at 12, York Place, Portman Square, Sir ANTONIO BRADY in the chair. The minutes of the last meeting having been read and confirmed, the following members were elected:—Jabez Greenwood, Esq., B.D.; Charles H. Cozens, Esq.; William Muller, Esq.

The SECRETARY then laid before the meeting the prizes awarded at the last meeting, which were as follows:—To J. W. Richardson, Esq., first prize, a large silver goblet, value £8 8s.; J. W. Richardson, Esq., an oil painting in frame; Lord de Ros, a silver goblet; Col. Locke, an oil painting in frame; W. S. Hobson, Esq., a silver goblet; Dr. Brown, a silver goblet; J. C. Stenning, Esq., an oil painting in frame; R. O. Milne, Esq., an oil painting in frame; Col. J. E. Turnbull, a large album elegantly bound in morocco; Captain G. F. Smith, an oil painting in frame; J. McAndrew, Esq., an album elegantly bound in morocco; R. Murray, Esq., dry plate prize, an oil painting in frame.

It was proposed by Mr. GLAISHER, and decided by the meeting, that the prizes and prize pictures should remain on view at 12, York Place for the ensuing fortnight.

A. J. MELBUISH, Hon. Sec.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THIS Society met at the Memorial Hall on Thursday evening, the 11th inst., Mr. T. MABLEY, Esq., president, in the chair.

After the routine business, Messrs C. Burton and I. Ambler were elected members of the Society.

Mr. CHAPMAN exhibited one of Turnbull's triple-wick lamps, which was tested against the sciopticon lamps, and pronounced inferior to it. The Turnbull flame was larger and less pure in quality, and not equal to the sciopticon lamps in illuminating the screen.

Mr. COVENTRY exhibited a camera front carrying seven lenses, three pairs of different foci for stereo work, and a central one for larger views, and so arranged to revolve that any pair, or the centre one, could be used, excluding the others in the most effectual manner. Mr. Coventry also exhibited some emulsion negatives, and a collodio-albumen ones.

The SECRETARY laid the *Bulletin* of the Belgian Photographic Association on the table.

Mr. COOTE exhibited some choice specimens of collodio-albumen negatives, part of his summer's work.

During the evening the Rev. Canon BEECHER, M.A., ex-president, unexpectedly entered the room, and was received with a burst of cheers. The Rev. Canon described his new mode of preparing emulsion plates. The customary notes were taken, and the meeting adjourned. C. ADIN, Hon. Sec.

Talk in the Studio.

AFTER EXPOSURE.—We have been favoured by Mr. Werge with an admirable example of the beneficial results of submitting an under-exposed negative to the action for a few moments of diffused light. Two portraits of a little girl on one plate are produced at one exposure with twin lens of precisely the same focus, aperture, and quality, the plate receiving intentional under-exposure, two seconds only having been given. One side of the plate was then covered, and the other exposed to diffused light passing through two thicknesses of white blotting-paper placed before the lens for four seconds. The result is striking: the under-exposed picture is simply useless, whilst the other, whilst not as perfect in all respects as a thorough exposed picture, is such a picture as many parents would gladly receive of some restless little pet to whom a long sitting is an impossibility. Mr. Werge's inside shutter is exceedingly valuable in aiding the successful application in this mode of working.

DALLASTINT.—We have been favoured by Mr. Dallas with an example of his new printing process, in which he endeavours to secure photographic half-tone in a surface-printing block. The subject is Hornsey Church, involving architecture, foliage, and figures. The result is probably the best approach we have seen to half-tone gradations in block printing; but it is still far from perfect, and we shall look with interest for further developments of this process.

"PREPARING" CARTES-DE-VISITE.—A case came on a few days ago before the Court for the consideration of Crown cases reserved, in which a conviction was confirmed against a man named Cooper. The prisoner was convicted at the Northampton Quarter Sessions of obtaining money under false pretences, subject to the question reserved and raised by this case, whether 281 letters which were put in by the prosecution were admissible. Mr. Jacques argued for the prisoner; Mr. Merewether in support of the conviction. The prisoner was proved to have advertised in the *Daily Telegraph* as follows:—"Two and sixpence per hour easily earned by beginners (either sex) by preparing cartes-de-visite papers at their own homes at 8d. per dozen. Employment permanent. Trial paper and instructions, 1s.—Davis, Brothers, Hardingstone, Northampton." On the trial it was proved that the prisoner inserted the said advertisement, that there was no such firm as Davis, Brothers, at Hardingstone, and that the prisoner was not in a position to give permanent employment. Six envelopes, each directed as above, containing answers to the advertisement and twelve postage stamps, were found in the possession of the prisoner on his being apprehended. 281 other letters were produced by the chief clerk of the post-office at Northampton in a sealed bag. The letters had also been addressed to the prisoner under the title of Davis, Brothers, Hardingstone, in reply to the said advertisement, and had been received at the office in like manner as those before mentioned, but, having been stopped by the Post Office authorities before they had been delivered, none of the 281 letters had ever been in the prisoner's possession or custody, nor was any proof adduced that they were written by the persons from whom they purported to come; but each letter had been opened by the Post Office before production at the trial, and each contained twelve stamps. The question for the Court was whether these letters ought to have been admitted as evidence against the prisoner. Lord Chief Justice Coleridge delivered the judgment of the majority of the Court that they were so admissible, and that the conviction must, therefore, be affirmed.

BLISTERING OF ALBUMENIZED PAPER.—At the Boston (U.S.) Photographic Society, Mr. Holton spoke of the trouble he had had this summer with his prints blistering in the hypo, which on drying would leave a bluish stain the size of the blister, and after experimenting, found that the trouble in his case was the use of a too weak hypo solution (10 to 15 grains by hydrometer). He increased the strength to 40 grains, which stops the blister-

ing in the hypo, but they blister in the salt water. To remedy that, after the prints are fixed, gradually reduce the strength of the hypo to 20 grains by the addition of water, and then transfer the prints to the salt water. In this way he has no blisters; uses double albumenized Berlin paper.

COLLODION PORCELAIN.—D. Pokonsky Joravko says, in the *Moniteur de la Photographie*: "I will give you a composition which I have been tempted to call collodion porcelain. Collodion at 1½ per cent., 80 grammes; gum myrrh, 1.50 grammes. The gum is dissolved by occasionally agitating, and the solution is allowed to rest until it becomes clear. Placing this composition on the plate, as is done with ordinary collodion, we obtain, after desiccation, a smooth, white surface, resembling ivory or fine porcelain. Glass transparent positives present a charming effect, and, seen by transparency, gain much by the delicacy and harmony of detail, whether lighted by day, sun, or lamplight. If, after complete desiccation, the collodion-porcelain is covered two or three times with photographic varnish, the coating becomes very tough. A glass covered with this collodion could well serve instead of the ground glass of the dark room. The collodion-porcelain may be coloured with aniline colours, and as a substitute for glass transparencies give charming and varied effects; the quantity of colour cannot be accurately defined. To procure a certain colour, take aniline pigment of this colour, and dissolve it in alcohol until saturation is nearly reached; this solution is added drop by drop to the collodion-porcelain until the desired tint is obtained.

"REMINISCENCES OF HEDGE-FIRING.—*Itinerant Photographer* (from under the cloth): "Will you keep quiet? How do you suppose—' Subject (who is evading the focus): 'Be Jabers, man! will I sit still to be shot at?'—*Punch*.

To Correspondents.

A. B. C.—There are various modes of ascertaining the angle included by a lens, the mathematical formula for which we have given in previous volumes; but they would occupy too much space for repetition in this column. If you have access to our seventh volume, you will find several articles devoted to the subject. If you have access to a table of tangents, you may easily make the calculation. First ascertain the equivalent focus of the lens, the angle formed by this and the base line of the picture. The angle included is twice the tangent of half that angle. Or possibly a simpler method is to proceed as follows:—Ascertain the equivalent focus of the lens; then measure the base line of the picture, and upon this line let fall a perpendicular, the length of the equivalent focus. Now with a protractor measure the resulting angle, and this will give you with sufficient accuracy the amount of subject included.

YOUNG MAN FROM THE COUNTRY.—The pictures by Mr. Faulkner in the exhibition are made from large transparencies produced from small negatives. 2. The powder to be employed depends on the colour required. Any fine pigment in powder may be employed; but permanency in the colour of the pigment is, of course, an important condition. 3. In producing enamels by the same process, vitreous powders—that is, powders of some substance which will vitrify when exposed to heat in the enamel furnace—are employed. Various dealers supply both the powders and the tablets. We believe you can obtain both of Mr. Solomon. 4. Different kinds of tablets are used by different manipulators. We believe the hard are preferred for the powder process. 5. Griffin's gas furnace with muffle can be employed for the firing of photographic enamels. 6. So far as we remember, the first three years of the Vanderweyde patent are not yet expired. We hope shortly to devote some further space to the powder process. The examples of that process in the exhibition are, as you affirm, unquestionably amongst the most perfect works of art produced by photography. One especial claim of the process is the power it places in the hands of an artistic manipulator.

NATIER.—The Autotype Manual of operations for producing all kinds of carbon pictures is out of print, but is re-printing, and expected, we believe, shortly to be ready. Of course it would be impossible to describe in detail any process in this column, for lack of space; but if you will let us know the especial points of information you want, or the difficulties you experience, we shall have pleasure in helping you. At present we have no idea how much you know, nor on what point you require instruction.

M. F.—You may not copy the engravings you find in books or illustrated periodicals, for lantern slides, without the permission of the publishers or owners of the copyright, either for private or public exhibition.

B. R. E.—The date of the annual dinner of the South London Society is not yet decided. It will be announced in due time.

A. PROVINCIAL AMATEUR.—The use of the baryta salt in the silver bath always causes an appearance of fog on the plate, inasmuch as the reaction of the nitrate of baryta salt on the sulphate of iron developer produces a precipitate of sulphate of baryta. If it be as great a deposit as you describe, you are probably using too much of the baryta salt. It is probable the pinholes which it has removed were caused by the presence of sulphate of silver. For some remarks on the object of the nitrate of baryta see a short leader in our next.

G. L. (Hull).—The pyroxyline you have been trying in your experiment in manufacturing collodion is manifestly unsuitable. As a rule, a suitable pyroxyline will give you a limpid workable collodion, with at least four or five grains of pyroxyline to the ounce of mixed solvents, ether and alcohol in equal parts; some samples of pyroxyline dissolving even much more freely. When you obtain a glutinous unworkable collodion with three grains to the ounce, it is manifest the pyroxyline is unsuitable. We are assuming that your solvents are suitable. If you are using ordinary spirits of wine, that is generally insufficiently highly rectified—that is, it contains too much water, and will give a lumpy and glutinous, or crapy collodion. The alcohol should have a specific gravity of about .820. It is possible to purchase good pyroxyline, but not always easy to get it in small quantities. We cannot tell you with certainty where to obtain it. The task of making pyroxyline is not really difficult, but requires care and some experience. The formula we have given in many *YARN-BOOKS* answers well.

Q.—Permanganate of potash will communicate intensity to carbon transparencies. The strength of the solution is not important; about ten grains to an ounce of water will serve.

J. D.—The toning bath is manifestly decomposed and useless, probably from touching it with hands which have been in contact with hyposulphite, the brown discolouration you describe indicating that as a cause of its inaction. Used with care, kept in the dark, and kept replenished, a toning bath will, as your friend has told you, keep in order almost any length of time; but if soiled fingers are immersed, if hypo or sulphate of iron touch it, or many other things, it quickly gets out of order. It will work well and long under good treatment; but quickly refuses to work under bad treatment.

B. L. E.—The only establishments in London where you can see the carbon process worked, so far as we know, are those of the Autotype Company, Rathbone Place, and of Mons. Lambert, at Greenwich: particulars in regard to each, you will find in our advertisement columns. There are, of course, other establishments working carbon, at which it is probable visitors would be regarded as intrusive.

H. B.—We do not know anything of the photographic bas-reliefs to which you refer, beyond the details given in the article. By whom they were produced we do not know, except that he was resident in Paris, and that Mr. Solomon was agent for this country. Doubtless specimens can still be seen at Mr. Solomon's warehouse, in Red Lion Square, and the best information can be obtained there.

H. STONE.—We have had so many articles on producing transparencies by different processes, that it is impossible for us to know to what special number you refer. As a rule, an article on transparencies for the lantern would give special hints as to the mode of applying various processes, without giving details of those processes, which the reader would be presumed to know, or to get to know. We send you a number, however, giving brief but comprehensive hints. A quarter-plate camera will answer your purpose.

A. CONSTANT READER IN TROUBLE.—Your case is certainly a distressing one, and the various remedies you have tried without avail only make it more perplexing. We should have said unhesitatingly, on a first glance at the negatives, that the stains were caused by uneven flowing of the developer: that is the cause their appearance suggests; but it is a cause so simple and obvious, that you could have scarcely failed to see it in the course of the efforts you have made. Nevertheless, carefully look to that, and note if the developer flow freely over the plate in an even wave, instead of being repelled, and flowing in greasy lines. We think you will find that it flows irregularly, as if the plate were greasy. In this case the remedy is simple: a little more alcohol in the developer, and a little more care in manipulation. If this is not the case, note carefully if the film show any stains either by reflected or transmitted light, on taking it from the bath, and let us know. The quality of your prints enclosed is very good.

C. ELDRIDGE AND C. W. LOVE.—Many thanks.

ERRATA.—In "In and Out" last week, a printer's error occurred: the velocity of a cannon ball should have been set down as between 1,300 ft. to 1,600 ft., and the transmission of sound as 1,100 ft. per second.

RECEIVED: Lantern Readings and Catalogue from F. York, and Photography in New Zealand, by Herbert Deveril.

Several Correspondents in our next.

The Photographic News, November 26, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY FROM THE SITTER'S POINT OF VIEW.

HALF the defects which sitters complain of in their portraits arise from their own nervousness and awkwardness. But the fault is as much that of the photographer as of his customer. Indeed it has often seemed to us, when we pass from the grand reception room, and through the elegantly fitted up boudoir into the studio, that the photographer rather takes a delight in over-awing his patron. Instead of making him feel as much at home as possible by the surroundings, the poor sitter at once feels ill at ease on entering the elaborately furnished drawing room to wait his turn, and as he sits down, he can hear his palpitating heart beating faster and faster as the dreaded moment of his being wanted upstairs approaches. He twitches his hat, cranes his head to catch a glimpse of his cravat in a tall mirror above him, coughs drily two or three times, and blows his nose nervously. This latter operation has disturbed his coat collar, and made him red in the face, and he gives a deep gulp, dreading lest he should not have time to recover himself from these unfavourable appearances. As time wears on, he is on better terms with himself, and actually gets upon his feet to walk on tip-toe round the grand apartment. The velvet pile carpet puts him on his best behaviour as he moves breathlessly about to look at the portraits mounted in their fine frames. He dare not lift his head too much, for fear of disarranging his collar, and every time he comes round to a reflecting object, he has a furtive glance at his dress, to ascertain that everything is straight and proper to his purpose. By-and-bye he musters courage and breathes more regularly, becoming at last emboldened enough to take up a case of enamels from the walnut table, only, however, to let it drop again out of his nervous gloved hands on the opening of the door, and a summons to appear before the artist above stairs. With a short preparatory cough, and an inclination to swallow something sticking persistently in his throat, he seizes hat and umbrella, and accompanies the attendant upward. Generally speaking, he has a long flight of steps to mount, and these do not add to his *sang froid*, but, on the contrary, trouble him as much as if he were about to see the medical officer about a life assurance. Unfortunately, too, there is but little time to calm down, for in busy studios fifteen minutes is much as can be devoted to any one sitter. There is little time for conversation, and the whole affair being strange to him, the sitter is ill at ease, and takes up the position or pose he is desired to assume, with a stiffness and awkwardness quite foreign to his nature. "There is nothing to be frightened at!" most photographers may be ready to observe; but this does not mend matters, and it is only after the sitter has well accustomed himself to the studio, to the surroundings, and to the photographer himself, that the latter can expect to make a good picture. It is for this reason that many gentlemen—Adam Salomon, for instance, who will take but four portraits a day, and others, scarcely less distinguished in this country, whom we could mention—make it a rule to give half an hour, and, in some cases, an hour, of their time to every sitter, and in this way, secure a quiet happy expression, free from all trace of awkwardness or agitation. Many of us, who feel stiff and constrained at our first appearance in a new locale, are easy and confident enough after a few minutes' interval; but if a portrait is executed during that first period of time, then it can hardly be satisfactory. We all know the artifices of portrait painters, who strive by all means in their power to engage the minds of their sitters for an hour together, in order to secure a happy and natural expression; and it is only under these conditions, of course, that photography can step in with advantage and secure a picture. The express speed adopted in some studios can never answer well, so far as the customer is concerned, for it is quite impossible to

obtain natural portraits at high pressure. Everything is so cut and dried that the sitter may sometimes be forgiven if he thinks he is simply undergoing "a process," and that the question of art does not enter into the matter at all. You pay the fee, get fixed up in a chair, the sun does its work, and you get so many copies of the image thus produced. That is the idea entertained by very many on the subject of photographic portraiture. An amateur of the humblest skill often produces better pictures than the more successful professional—or, in other words, pictures that are liked better by the sitter. Indeed, it is surprising how few mishaps the amateur really has, if we except technical failures; and the principal reason is undoubtedly the circumstance that his sitters are for the most part friends, who come to him perfectly at their ease, chat till the moment they are taken, and regard the whole thing as a pleasure or a joke, rather than in the light of a serious undertaking. Professional photographers would be only too delighted if they could get their customers to come to them in the same happy frame of mind, and behave in a similar *sans souci* spirit; but this they will not succeed in securing, unless they give up more of their time, and render the sitter's *entré* less formal. It is a difficult matter, we know, to draw the line to define how far one should make the entrance to the studio fine and imposing, to impress the sitter with a sense that everything is done that money can do, without calling up a corresponding feeling of embarrassment, a thing which photographers are most anxious to avoid. In Paris, at Liebert's establishment, and in that of M. Walery, there are magnificent reception rooms provided, conservatories, and retiring boudoirs handsomely fitted up, and everything upon a scale of unprecedented luxury. At Reutlinger's, on the contrary—where, at any rate, a large part of the rank and fashion of that metropolis resort—the studio is very small indeed, and the reception room is mainly comfortable and well furnished, but nothing further. But one can scarcely draw any conclusions from these establishments, for they all thrive very well. Of course, in the production of cheap photographs, it is impossible for the operator to devote much time or care to each sitter, and the operations must necessarily be somewhat hurried. But in high-class studios the main object is to secure good portraits before everything, and these are scarcely to be expected unless the sitter can be made to feel entirely at his ease.

PEN-AND-INK SKETCH OF A LONDON STUDIO.

BY D. K. GRIFFITH.

GENTLEST reader, by courtesy of the Editor I will ask you to accompany me to one of the fashionable studios in the West-end, in order to show one to Mr. Afong, a Celestial gentleman who, unlike the Chinese of Shanghai, in a former sketch, has entered the arena of European art, associating his name with photography in its best form, and justly stands first of his countrymen in Hongkong.

"Who man the Editor? My plenty time have hear he name. My thinké must belong all the same large Mandarin."

"You are not far out in your supposition, most worthy Afong; he is the leader and governor of this journal, and, as such, has arbitrary rule. His is the power to pronounce judgments, levy contributions, issue sentences, take your head off, or shorten the length of your tail (tale). With all these vested rights, we must have due regard for the dignity of his position, and will have to approach him with extreme caution. At the same time, take courage from the fact that, if worthy of the companionship, he will not cut you altogether, and I can answer for myself never having lost an inch. So make your lowest salaam with respect and confidence. And now what say you to our visit?"

"My too muché like go along you and look see how fashion you maké that facé England side."

"Well, Afong, I will ask you to change your handsome costume for an English suit."

"My savy just now have got new law England side, so that ebery piecé man must wear he coat one fashion. My have see in that *Photographic News* a too muché largé bobbery.* One piecé man talké must have coat swallow tail fashion; nother piecé talké no can. My thinké all belong too muché curio. How he can swallow him tail, too muché curio. Or perhaps you no liké walk along my, 'cause you have shame facé."

"I don't wonder that you should assume there was a new law to that effect. I will ask you, however, to don an English walking coat. We are not ashamed of your Chinese dress, but London crowds are not exempt of curiosity, and we would stand the risk of being mobbed, not by the better classes, gentlest of gentle readers, but observe the little mortal with the basket under his arm, who whistles as he wends his way in seeming indifference of things in general and the world in particular: arrayed in your celestial finery, he would be your terror. Don't smile so incredulously at that, my friend, or you will get into a chronic state of unbelief when I further inform you that yonder tiny waif is of importance to the State, and, if resident abroad, and a foreign power, in contempt of his forlorn aspect, were unjustly to take his life, the wrong done to him would be a wrong done to this empire; and throughout the length and breadth of the land there would be calls for justice. Mighty statesmen would deliver orations; military and naval leaders would be called upon to prepare for active service; a whole fleet of noble war vessels would steam for those foreign lands, conveying a monarch's and a people's demands for justice. Such is the proud birth-right of a Briton, which associates the humblest of us with the honour of the Imperial State; and this ennobling influence, with another I cannot enter into here, is the secret of England's greatness.

But we have been keeping the reader waiting, and, as I have the honour of being on terms of close intimacy with Messrs. Smudge, we will visit their rooms.

"Who man he? Have got very largé place?"

"Well, Afong, you will not find the rooms as large as those in the East, space in London being so very precious; but it is the best in the most fashionable street, and little else than the *Court Guide* is required for their office directory; but you will sometimes see the followers and imitators of nobility there as well, who adopt a bearing of condescending patronage that the high tone of the house will not suffer, and so their visits are 'few and far between.'"

Here we turn the handle of the door, the plate-glass portion of which bears the name of that distinguished firm. It swings back, and we pass through a hall-way of sombre aspect, and from thence ascend a winding staircase. We are here met by a page boy, who throws open a door, and we enter a spacious suite of rooms carpeted with a soft Turkey fabric; the walls are hung with paintings representing in their brilliant colours so many of the distinguished of rank and fashion; tables dispersed about are loaded with exquisite little gems of art, consisting of ivory miniatures, medallion photographs, and all the other etceteras of art which are formed to delight the eye of taste. Several persons are its occupants. Mr. Trustworthy, the clerk, is comfortably located behind a desk, engaged in the intricacy of multiplication, and whose indigo-tinged visage appears in contrast to the jolly rubicund countenance of an elderly gentleman in close confab with my friend Smudge. It is impossible to mistake the gentleman as he stands there in an attitude of honest heartiness, the beau ideal of an English country squire, and is now suggesting to the amiable Smudge improvements of colour in the portrait of the lady Florence Graceful.

"It all lays in a nut shell!" we overhear him say, as we enter.

And if we had any doubt before, his words would have confirmed the identity.

* Bobbery, a commotion.

Who is it that has not heard this expression? nor associated it with an old gentleman of goodly development and kindly beaming eye; in an attitude admonishing his hearers that the whole matter of their debate is "contained in a nut-shell"?—and who, having thus tauntingly concentrated the argument into that convenient space, flounders on in a would-be elucidation of the discourse, until, hopelessly, he drifts into chaos, flourishes his arms, looks sagacious, then collapses into the retirement of a back seat. Even now he has just concluded a learned dissertation on chiaroscuro for the benefit of Smudge's acknowledged genius, and will go away perfectly convinced that he has benefited by his sage counsel.

Next to him, we have the gentleman who has swallowed the nut. Behold him microscopically examining the portrait of a celebrated physician: the gentleman writes three distinguishing initials big in science after his name; he is of the dreamy type, and at present is compiling a work on "Psychic Force," to which he associates "Spiritualism." It is that, gentlest reader, which takes him here to test the truth of the assertion made by a spirit at a recent seance, who averred that the collodion used by photographers had such a widespread influence upon the atmosphere, and was each day getting so extended, that it fully accounted for the modern phenomena of spirit seeing, so that they found it very difficult to dodge the influence of the iodized atmosphere; and bitter were his complaints of the way he got caught. Then he entered with much eloquence upon the good old times (before they had sunk into being scientifically termed a mere "ideomotor-action"), when they could enjoy their shady retreat in comfort, without being subjected to answer the impatient and sometimes harrassing questions of every inquiring mind. But as the result of this visit will no doubt appear in a pamphlet, entitled "Psychological Enquiries," we refer the reader to it.

Close beside him are two figures, and at a glance we discover them to be father and son; the elder gentleman of the two, with the glasses on his nose, and stretching his neck forward to get a close view of a portrait representing the Lord Mayor of London in full official splendour, is the senior partner in the princely mercantile firm of Grabem and Keepem. Don't suppose, gentlest reader, that I am pointing out an ordinary trader; a more honourable name humanity could not enjoy, and he cherishes it with noble pride of all the inheritance he will leave to the son, who is leaning upon his arm. The proud enjoyment of his name he values as the best portion, and jealously guards it against any encroachments; it is a capital lodged deep in the strong box of his integrity, guarded by the actions and feelings of a gentleman.

Standing a little away from him, and, as it were, in the relative position of middle distance, is one whom we would denote a "Citizen of the World," from the seeming indifference of the position he has placed himself in, and that assumption of manner which indicates the proud self-reliant man of action. His visit to the rooms seems to have no other object than to pass away a few idle hours.

But the most pleasing figure in the group is a gentleman of quiet reserved bearing, a picture of unassuming worth, whose glance is directed to a portrait of my Lord Bishop. He seems to have the points alone conveyed to his mind, and stands a little apart, now from one side, then another, so as to get the advantage of the best light. He is one of those highly educated minds, the very essence of which has been the study of its vital energy, and the perfect representation of its figure proclaimed.

There is a gentleman here who refrains from the treatment of the subject, and you would not be able to say all; and let me say that he is a gentleman.

I introduce you.
"Gentlest reader, Mr. Smudge; Mr. Smudge, gentlest reader."

"Glad to see you and your friend, old fellow; always delighted to find that I am not forgotten. Been to the exhibition?"

"Yes: spent an hour there, and, assisted by the remarks in the newspapers, enjoyed it immensely."

"The pictures this year in carbon are particularly fine."

"There is certainly little more to be desired; but I have no faith in those produced by that process on ivory."

"I am astonished to hear you say so. What is your reason?"

"Just this: I believe every bit of it will peel off. If I am wrong, correct me; but it seems to me the only practice at present to prevent their doing so is by applying a coating of normal collodion. Now, I will venture to predict that many a beautiful miniature on ivory will be utterly destroyed by cracking and peeling off the surface; indeed, I look upon those taken to hot climates as standing no chance, their only safeguard being the care they will receive; but if exposed in a careless manner, I sorrow for the result."

"Then in the case of coloured work on paper, where the practice is resorted to of cutting out the head, and, by double transfer, using them as the base in drawings, the deep blacks are safe to crack in the same way. Collodion will only keep them right for a time."

"But we want to look over your operating room. Smudge, where is the operator, Mug?"

"He is up in the glass house—the atelier, as he likes to call it. We must not go there, however, until we get his sanction. You know he is jealous of his dignity, and will not tolerate interference."

"What would he say of the levelling ideas of the correspondents of the NEWS?"

"That is all sheer nonsense. Each house finds its own standard in the man, with just such accomplishments as suit them, and which could not be classified. Nor would it matter much to a clever artist whether he held a written warrant of ability from those probably less competent than himself. Let us be satisfied to—

"Shuffle off this mortal coil."

As photographers, you cannot make anything less nor anything more of it—unless it occurs to the mind of Imperial Majesty to take greater cognisance of an art associated in its birth with the history of her reign, and begin by conferring honours upon some of us. But, in the absence of those honours, I am satisfied high-class photography will never disgrace us if we never disgrace it."

We now ascend to the atelier. After passing Smudge's painting room, of northern aspect, and two dressing rooms on the floor above, and, before our breath is quite exhausted, we approach the horrors of the operating room.

But stay! we must not enter; for listen to the sounds so familiar to domestic joys! It is an infantile warning. The latest addition to an ancient and noble house is undergoing the tortures of the operation.

There stands Mug, the daemon of the hour, strutting from instrument to sitter. Now, leaning his head to one side to get a general view of his little victim's pose, observe the solemn cast of his countenance, and the shade of agonizing study on his intellectual brow. Suddenly the eye brightens with a flash of happy thought, and, as if fearful that its benefit would be lost to the sitter, he springs forward, and, with a graceful flourish of his hands, gently adjusts the head. But his desire for pictorial beauty makes his little victim cry out lustily. Mug assumes the tone of the nursery, and gets the baby into proper range of his camera. The little victim then kicks into space in the most unseemly manner; next tries to swallow its shoes; and, getting red in the face from the exertion caused by the effort, indulges in the predilection

apologizes for her little darling, and the maternal solicitude in the pleading eyes reconciles him to the interruption.

And now, gentlest reader, I must leave you. My light hasty sketch is before you, and my supper is before me. So good night, and you, most worthy Afong, "chin chin."

PANICONOGRAPHY.

BY DR. HORNIG.*

For some years past, the firm of Gillot et Fils, of Paris, have been working a process under this name, which consists in producing blocks in relief by etching upon zinc. The process is one which yields such excellent results that we feel it a duty to describe it to our readers, the more so as photography now plays a very important rôle in the matter. A recent visit to the establishment of MM. Gillot et Fils has afforded us an opportunity of witnessing the operations of the process, which finds valuable application in connection with photography.

The paper employed in the process may be purchased in commerce, or may be prepared by covering Indian paper with a film of starch paste, the paper being dried and pressed with much care, and kept as cleanly as possible. A particularly good autographic paper may be obtained by applying one or two films of gelatine solution, so that only a very thin and uniform coating is produced, which does not run on the paper being hung up to dry. When dry a coating of cold paste, made some days previously, is applied, and afterwards an application of gamboge dissolved in water. The paper is subsequently well rolled, so that no fatty matter shall come into contact with it.

The zinc plates employed must not be too soft, and should be rendered more favourable to the application of a greasy image by washing in potash or soda solution. Oxidised or moist plates will not take the colour; warm ones allow it to run.

The image produced in fatty ink upon the paper, however it may have been furnished, is placed upon the zinc plate face downwards; a sheet of paper moistened with very dilute hydrochloric acid is placed upon it, and above this are put sheets of dry paper, and the whole passed two or three times through a lithographic press. If a non-prepared paper is employed, the plate should only be passed once through the press, as the paper will not cling to the metal, but, being spread out by the pressure, causes a double image to be formed. A too powerful pressure makes the lines of the image thicker.

The back of the paper, with the image, is now well moistened with water, and then the paper-backing may be removed from the zinc, upon which remains the fatty image, as also the preparation, if any, which was in the first place applied to the paper. A soft sponge is now employed to wash the plate, and then it is washed over with gum-water to which a little hydrochloric acid has been added. The latter is allowed to dry upon the metal, which is slightly warmed on purpose. The acidified gum solution must first of all be tested upon a zinc surface, and should not attack the metal with much energy. Solution of nut-galls may be employed in place of it, if preferred, as in the case of photo-zincography and lithography.

The plate must be allowed to stand in this dry condition as long as possible. The gum is then removed from the surface by washing, and the image is rubbed with a roller in the same way as in lithography. The first ink applied by Gillot is a composition of ordinary lithographic ink, white wax, resin, and lithographic varnish. The plate is again permitted to dry, and then over the whole surface is spread, by means of a tuft of cotton-wool, some finely-powdered resin, which at once attaches to the greasy particles, and imparts to the colour a consistence sufficient to shelter the covered parts from the action of the sun.

* Photographische Correspondenz.

The powdered resin upon the other portions of the plate, between the lines and the letters, is removed by means of a second tuft of wool, and then the borders and back of the plate are covered with shellac varnish.

The etching is now proceeded with. A trough made from a mixture of gutta-percha and asphalt is made of proper dimensions, and of such a nature that it will rock. This rocking trough must be kept in motion the whole time that the etching operation is proceeding, so that the liquid moves to and fro over the plate, and washes away any salts which may become formed by the acid acting upon the zinc. In the establishment of the Messieurs Gillot there are two apparatus, each having four of these troughs, which are moved by a small steam engine. Each trough takes up an area of one and a-half square feet. The concentration of the acid governs the depth of the etching, and therefore it is considered desirable to have the acid mixture always of the same strength, the liquid falling from a dropping-bottle fixed above the trough. The first etching must be very weak, and should be confined to the white parts, which are the darkest portions. As soon as this is sufficiently accomplished, so that certain parts are placed in slight relief, the plate is taken out of the trough, washed, and dried, and brought into an oven mildly heated, when the resin fuses and runs down the walls of the relief already formed. It is a question now, not of producing a relief sufficient for printing in the printing-press, but to protect every separate etching, which gives the tones of the picture, from the subsequent action of the acid. A series of operations are necessary to do this, which necessarily require practical experience to carry out, and are not to be fulfilled by one who possesses mere theoretical knowledge.

As soon as the fused resin has formed a sufficient protective coating, the plate is taken from the oven and allowed to dry in the open air; it is then rolled up again with the re-transfer ink, together with two parts of fatty and resinous substance, and as much litho varnish as will permit the composition to run easily over the lines or letters of the image. The plate is strongly rolled, so that the black parts become pasty, and then powdered resin is applied, bringing the plate a second time into the trough. The second etching, which is required to attack the less dark parts, requires to be a more vigorous one. The plate must also be more highly warmed, so that the fused resin is more fluid, and spreads over and protects the parts grained in the last operation.

For six or nine times is the operation repeated in the same manner, until, by continued rolling up of the plate and fusing of the powdered resin applied, the image is completely etched by succeeding steps, the final etching being most powerful, in order to hollow out all the white portions. When there are large surfaces of white in the image, these must in the first place be protected with a solution of shellac, so as not to weaken the etching liquid too much at first, and to supply a point of vantage for the roller.

After the etching operations have come to an end, the plate is washed with great care, in the first place with caustic potash, and afterwards with benzole, to remove the resin and ink. The white portions which have not been acted upon are cut out with a narrow saw, and the grained plate is then fixed into a press.

As the work of MM. Gillot et Fils testifies, and as I myself can also bear witness, the results of the process which I have here briefly sketched yields most excellent results, but some amount of practice and artistic skill are required on the part of those who carry on the operations. The etching of the plates must be carefully watched, so that the fine lines and delicate portions of the work may not suffer. The beginner is liable to etch some portions and cover up others too much; but with an intelligent operator successful and certain results are obtained in a very short time.

The process of paniconography, which is known in Paris under the name of "Gillotage," has rapidly spread, and is employed in that metropolis for illustrating newspapers and other publications. Employed in conjunction with photography—or, rather, photo-lithography—it permits of obtaining a photo-type plate for the printing-press of any drawing or design in a very short time, the reproduction being either on a larger or a smaller scale than the original. It would be desirable that every printing establishment of importance should possess a lithographic press and a workman skilled in this particular kind of work; and it would be well if our photographers were to practise more assiduously the chrome-gelatine photographic process and photo-lithography, so that they might become more conversant with the photo-mechanical printing processes of the day.

AN EXCELLENT LIGHTDRUCK PROCESS.

BY PROFESSOR J. HUENIK, OF TABOR.*

Basis.—As a basis I employ a polished glass plate, three lines in thickness, or may be thicker. These plates are polished matt on one side by rubbing them with finely levigated emery powder; the powder is moistened with a little water, and applied to the glass surface, the emery being uniformly moistened by rubbing with the finger. This is very necessary, for should any dry emery come in contact with the glass, deep scratches are at once produced. Another glass plate is placed upon the one covered with moist emery, and the former is rubbed by a circular movement, and with very little pressure. In a few moments you perceive that the noise from the breaking up of the large particles ceases, and then more pressure and freer and quicker manipulation may ensue. For about ten minutes the task should be continued, the grains of emery becoming smaller as the work proceeds, and the matt surface of a finer character. If, after the plate has been washed, it turns out that the glass surface has not been evenly rubbed, or that by reason of the inequality of the plate certain portions have not been touched, the grinding must be proceeded with, a fresh supply of emery being obtained. The action must be continued in order to reduce the size of the grains as much as possible. In this way two matt plates are produced at one and the same time.

If it is a question of employing plates a second time, these, in order to be freed from gelatine, are put into a lead or zinc vessel containing an alkali solution formed of slaked lime or soda. This alkaline liquid may be preserved in good condition for more than two months, and may, by the addition of a further quantity of lime, be invigorated when necessary. In a bath of this kind the hard gelatine film becomes softened in a period of twelve hours, and the glass may then be cleaned with sawdust, or some such material, and washed. The plates are then ground with emery powder in the manner just described in order to free the pores of the glass from any gelatine remaining in them. Finally, the plates are rubbed with a rag, and rinsed in several waters, and then dried.

First preparation of the plates.—I take 25 parts of white of egg, 45 parts of distilled water, and 8 parts of solution of soda water glass, such as can be obtained in commerce. The white of egg must be perfectly free from the yolk. The three constituents are mixed together, beat-a to a froth, and then allowed to stand. Next day, or at any rate after an interval of six or eight hours, the clear portion is decanted off, and filtered through a clean cloth. This will render subsequent filtration through paper much easier. An open glass vessel, or glass beaker, is taken, and a glass funnel is put into it, so that the tube of the latter reaches nearly to the bottom; the filter is then fitted with soft and thick filter paper, and the mixture poured in. The pores of the paper are very speedily stopped, and the process

* Photographische Correspondenz.

of filtering is suspended; for this reason the solution is poured from the funnel back again into the glass vessel, the filter paper is replaced by new, and the solution again passed through it. This operation will have to be repeated several times before all the liquid in the vessel has gone through the filter. When the liquid has been once filtered, it can be easily submitted to a second operation without the filter paper being changed. For this reason the filtered liquid is poured into another glass and filtered a second time. As the first filtrate always contains a few hairs or fibres, the liquid that passes through first of all should always be poured back to go through the filter again, and in this way a perfectly clean liquid free from bubbles is obtained.

To prepare the plates a sheet of glass of large size is laid down horizontally, and on it is placed one of the matt plates, which has, first of all, been dusted with a brush. Upon its surface, and near the edge, is poured some of the solution above described, and this is spread over the plate by gently inclining it. Those parts which are not wetted in this way are afterwards covered with the liquid by spreading it with a strip of paper; but, in any case, the liquid must not be allowed to flow quickly, but gently in a line downwards. Another vessel is brought to one corner of the plate, and there the glass is quickly turned on end, so that the superfluous matter runs off. The quick withdrawal of the liquid carries away any air-bubbles which may have been formed when the fluid was spread with the paper; but, if any should yet remain, a little more of the filtered solution is applied, and then again rapidly drained into the second vessel. The plate is permitted to drain, and is set up against the wall to dry. The fluid which has been poured off the plate must be filtered again before use. In this way a large number of plates may be prepared, and, in this condition, may be kept for six months. They must never be used immediately, but should remain a day or two before being employed. The longer they are allowed to remain, the better they are.

Second preparation.—To coat the plates with gelatine, they must first of all be thoroughly rinsed with cold water, best under a tap, but without the prepared side being touched. They are then dried, and ready to be treated with gelatine. This is done in the following manner: a box having a sheet iron bottom, and a cover of dark linen or cloth, is provided; inside, three inches above the iron bottom, is a frame, spanned with linen exactly the size of the interior, and this is covered with filter paper, loosely laid upon it. This frame should equalise perfectly the unequal temperature of the iron below, for under the box is fitted a gas or spirit flame. Three inches under the lid are iron rods from one side of the box to the other, placed horizontally, each rod being furnished with two or three holes, into which screws are fitted, upon the heads of which the glass plates rest. By turning these screws so that the heads are raised or depressed, the plates are easily brought into a horizontal position. A thermometer suitably fitted in the side of the box indicates the temperature. Two, three, or more glass plates are laid horizontally upon the screws, the box is closed, and the temperature raised to 30° Réaumur. In the meantime, a quarter of an ounce of gelatine (7.5 grammes) of the finest French gelatine is taken; five ounces (150 grammes) of distilled water is poured upon it, and the gelatine allowed to swell for an hour. After this the gelatine is dissolved upon a water-bath, and when it has reached a high temperature (say 70° R.), fourteen grains (0.875 grammes) of bichromate of ammonium, and ten grains (0.625 grammes) of chloride of calcium are added; finally, after everything has dissolved, an ounce (30 grammes) of ordinary spirits of wine is added, and the mixture filtered.

The filtered solution is poured upon the warmed glass plate, and spread over the surface by means of a strip of paper. Not too much, nor too little, liquid must be applied, but only so much that, when the plate is inclined, only a little of it betrays a tendency to run off. When the operation has been carried out several times, the proper amount

to be applied is easily guessed. Too thick a film does not last in printing, as the scraper abrades the surface; and too thin a film, on the other hand, permits the fine grains of the glass to appear as little black spots, the force employed in the press being the greater. When coated, the plates are put into the box and allowed to dry at a temperature of 35° R. Plates prepared to this stage will keep good in summer for the space of a week, and in winter time for a month, becoming better after keeping a little while.

The Exposure.—This may be estimated at three-quarters of an hour in the shade, in the case of a good negative, or a quarter of an hour in the sun. Diffused light gives the best half tones. After exposure the chrome salts, which have not been acted upon by light, are washed out with water, and the plate well wiped and put to dry. After three hours the plate may be employed for printing purposes.

Printing.—The plate is fixed by means of plaster of Paris to a lithographic stone, and printed by the aid of a lithographic press. The plate is moistened and treated with two different inks or colours, one thick, one to blacken the plate, and one having a brownish tone, which gives the half tones. After every printing the plate is again wetted and wiped with a rag, when the inking is proceeded with once more. If the plate gives but little half tone in the shadows, a blind proof is taken off, which takes off the last remnant of the colour, and then the plate is wiped once more and printed. A plate of this kind should furnish 600 prints or more. The permanency of the plates depends upon due attention being given to their preparation, upon having gelatine that swells but little, and employing little force in printing.

Concluding Remarks.—This method, according to my experience, is the best of the kind yet brought forward. It yields more certain results, and appears also to be pretty well known without a word as to its details having appeared in print. M. Obernetter, of Munich, I am told from a good source, employs soluble glass, as likewise do other firms in Vienna; and Koch especially, who since the Austrian International Exhibition has produced some very fine specimens of Lichtdruck, also makes use of soluble glass in his process. The latter gentleman has considerable scientific knowledge of photographic chemistry, and if it were not, unfortunately, for his inability to work, from illness, he could inform us of many interesting experiences and discoveries which he has made. In the State Printing Office this process has also been employed for the past two years a plate yielding as many as 600 impressions.

Some operators replace a portion of the gelatine with isinglass. This substance is to be obtained, as a rule, only of inferior quality, and is very dear; the bleached material is perfectly valueless, and the only quality to be recommended is the Russian.

The choice of colours is important. If a brown tone is desired, then Munich varnish must be added to the black ink. This has the defect of colouring the plate, so that in the end it is not white, but brown. This varnish has the effect also of tanning the gelatine, and the prints soon appear flat. A good brown mixture is afforded by the finest printer's black of the thickest kind mixed with red oxide of iron and a little Casar varnish.

To preserve the margins perfectly white, the negative is covered up to the image or design. On printing, fine tissue paper is cut into bands of two or three inches breadth, and these are put on the edges of the plate, which are to remain clean before the printing paper is applied. Or a frame may be employed, the aperture of which represents the size of the plate, and over this is stretched tissue paper saturated with paraffin, and an opening the size of the picture is cut out, and this frame of paper is laid upon the plate every time an impression is struck off. I thought the time had now arrived when the process should no longer remain a secret, and have therefore published it in the hope that it will receive frequent application.

The Photographic News.

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NITRATE OF BARYTA IN THE SILVER BATH.

SEVERAL correspondents have recently asked for an explanation of the precise operation of nitrate of baryta in the negative bath. A "Provincial Amateur" complains also that the appearance of fog it produces is, notwithstanding that it disappears on varnishing, very perplexing during development, and renders it difficult to determine when the proper degree of intensity is obtained, the issue being that he frequently finds his finished negative more intense than he intended. He has found, however, that its addition to his bath has effectually removed a tendency to pinholes when the orthodox treatment for getting rid of excess of iodide of silver had been tried without the slightest effect. It is probable, from the results recorded, that the presence of nitrate of baryta in the silver bath may have some action which is not well understood; but its beneficial action in the case of our correspondent appears to have been simply that for which it was originally proposed. Its use was first suggested and tried by Dr. Vogel for the removal of sulphate of silver from the nitrate bath. At the time, there was a prevalent outcry from many photographers as to the presence of pinholes in their negatives, manifestly not arising from iodide, as they appeared in a new bath, a lack of sensitiveness and poorness of image being, in many cases, a concomitant of the pinholes. Enquiry and research led to a suspicion as to the presence of sulphate of silver, and the test and remedy proposed by Dr. Vogel proved satisfactory. On the addition of nitrate of baryta a precipitate of sulphate of baryta was formed, and the working conditions of the bath were at once improved. The chief drawback that remained was a tendency to excessive intensity, or even hardness, in the negatives. The grey veil of sulphate of baryta precipitated on the film on the application of the iron developer was another minor drawback, which probably, as our correspondent imagines, contributes to the first drawback by misleading the eye of the operator as to the degree of intensity obtained. A little experience and care in manipulation will serve, however, to obviate both difficulties.

When the subject was revived at the South London Society about a couple of years ago, a variety of virtues were claimed for the baryta salt; but no theory was put forward as to its action. The majority of those who have tried it, however, speak favourably of its action. A correspondent of our Philadelphia contemporary details an interesting case of the purification of silver by its aid. It is probable that sulphate of silver had been present. He says:

"I had occasion a few days since to dissolve a lot of silver coin, which I sometimes do for the purpose of making a bath; but amongst this particular lot was a lot of scrap silver obtained at the jeweller's, and guaranteed to be pure silver; but I found after dissolving it that it contained quite an amount of either lead or solder used by jewellers

and it was a good deal of trouble to cleanse this out; and when I got the solution ready for work and coated a plate, I could not get a full-timed image under twenty or thirty seconds, and found the bath kept depositing a fine white powder. After repeated trials I bethought me to try the effect of baryta. I added about four grains to the ounce of solution, and also an additional dose of iodide, and again tried the bath. Lo, and behold! a change had come over it—a great change. I could make a picture in two or three seconds and have plenty of time, and the bath improved daily; and I enclose you a card made with it to show you how it works. Not that this card has any particular merit except the time in which it was made, which was half a second as near as I could calculate, by exposing as rapidly as it was possible to uncover and cover the lens; you will perceive that from the subject, and the position itself shows the work had to be done quickly."

A PHOTOGRAPHER'S ADVENTURES IN THE SOUTH SEAS.

OUR readers may remember that, among others who took part in the transit of Venus expeditions despatched to all corners of the globe, was Dr. Hermann Krone, the president of the Dresden Photographic Society, and editor of the organ of that body, *Helios*. Dr. Krone's reputation as a scientific photographer very naturally attracted the attention of his countrymen on the occasion of the preparations being made to observe the phenomenon of Venus passing over the sun's disc, and the Berlin Academy invited the learned doctor to aid in securing records of the rare event in question. In response, Dr. Krone at once expressed his readiness to proceed to any station where he could be of assistance, and the distant Auckland Islands was ultimately fixed upon as his destination. Thither he proceeded, and his departure from the Saxon capital left such a blank among photographers of note, that not only had the issue of *Helios* to be altogether suspended, but the Dresden Society likewise postponed its meetings until the return of its president.

Dr. Krone has now returned, after being absent from his fatherland upwards of twelve months; and his experiences as a photographer in that distant corner of the earth to which his duty called him are so interesting that, notwithstanding the lapse of time that has intervened, we do not hesitate to give them to our readers. His report is embodied in a letter to Professor Vogel, of Berlin, and we may confidently affirm that, since M. Reméle described his journey through the Libyan Desert, we have read no more interesting communication from the pen of a photographer.

To get to their remote destination, Dr. Krone and his friends came to England and embarked for Melbourne. It was supposed that from this part a passage might be secured in some ship proceeding in the direction of the Auckland Islands, but ultimately it was found necessary to charter a vessel on purpose. Finally the French bark *Alexandrine*, Captain Veaujoyeux (with a crew of ten men) was engaged, and the party, consisting of two officers in the German marine, Dr. Schur, Dr. Wolfram, Dr. Krone, and his son, embarked for their destination.

"The ship was quickly provisioned, the cases of instruments and necessaries taken on board, a carpenter, a cook, and steward were hired, and on the 3rd October, early, the vessel sailed.

"After a stormy voyage, and experiencing for four days a dreadful hurricane, during which a terrible sea broke over the ship continually, the water dashing through the windows of the captain's cabin and into our cramped-up sleeping places, we came in twelve days, on the afternoon of the 15th October, to Port Ross in the Auckland Islands, and in the evening, at eight o'clock, anchored about a mile from shore near Terror Cove, in the little Shoe Island. An attempt on the following day to get nearer the shore was unsuccessful, and therefore the labour

of unloading and landing our heavy cases was rendered very great indeed. To add to our troubles, the sea ran very high; but, let the weather be what it might, we had to row on shore every morning early, and back again at night to sleep, completing our arrangements as quickly as possible. We worked as carriers, packers, and builders, turning our hands to all kinds of work. We discovered the place where Ross made his observations in 1840, and chose the same spot for our own observatory. Here the dense bushes and reeds which cover the island had been cleared away (thirty-four years ago, but, of course, the brushwood and shrubs had grown again since then, and many days' hard work with axe and shovel were necessary before we had cleared the place once more for building our dwelling house. At last we succeeded in levelling the ground properly, so that we could commence building. A carpenter made one of the party, and the walls of the house soon began to rise; and it was not until we had the roof on that we possessed any shelter at all from the rain and hail, which at times became exceedingly Aucklandish.

"If any of our friends engaged in neighbouring expeditions could have seen us they would have wondered much at our industry and at the development of qualities which we did not imagine ourselves possessed of. All of us, the two naval officers included, had to clear, chop, and build for weeks together accoutred in waterproofs, sou'-westers, and jack-boots, damp externally by the never-ceasing rain, and internally by the profuse perspiration engendered by our newly-accustomed work. Ofttimes did we throw on one side our waterproofs, seeing that they did not protect us from the wet, and put on our wet clothes of a morning, which never seemed to get dry. How we envied our comrades who had gone to Kerguelen's Land, who had the assistance of the *Gazelle* war-vessel, and our brethren at Tschifu, who were aided by the *Ancona* gunboat, and a body of Chinese coolies besides! The German government had sent no vessel with us to render assistance; on the contrary—thanks to the irony of fate—we had to be dependent upon the craft of our old 'arch-enemy,' the French, to carry us to this God-forsaken spot.

"To fill the cup of misfortune to the brim, our carpenter fell ill after a fortnight's work upon the island. That we were not all of us laid up under the circumstances we have to thank our constitutions, as also the circumstance that we had no time to become delicate, the work was so hard and incessant. A medicine chest which we had with us, and which contained a few printed instructions, had to serve us as surgeon. Dr. Seeliger, in clearing the bushes with an axe, had the misfortune to deal himself a severe cut over the foot, the blood streaming out from the hole in his boot; fortunately we found a supply of strapping in the chest, and so were able to tend our wounded friend pretty well. Then Dr. Schur caught a violent cold, and suffered from a raging toothache, which kept him away from work more than a week. In this case we could only hope that our patient would get better.

"We had a large supply of quinine with us, to enable our constitutions to combat the fever-breeding swamps of the Auckland Islands; but, fortunately, we did not stand in need of this tonic. Many of the medicines mentioned in the printed instructions were not, however, to be found in the chest; but as we were fortunately free from any grave sickness, this did not matter so much; otherwise we should have been in the same strait as yourself when on the Nicobar Islands. It should be imperative, I think, that a scientific expedition should be accompanied by a medical man, to afford assistance and advice in case of need.

"After we had completed our house, we proceeded, with the help of the sailors, to build up the iron moveable towers, from which the storm often tore the canvas roofing. In building up the pillars, our carpenter had more practice than we, and so we acted as labourers to fetch material,

while he put it together. On the 20th November we unpacked our chemicals in the dark room, and the next day took the first landscape photograph. On the night of the 22nd—23rd November an extraordinarily high tide washed two of our photographic cases into the sea, overturned our water-gauge, and washed the tide-observer, with its self-registering clock inside it, between the lava blocks and the beach, whence they were, however, soon recovered and set up again. Some months afterwards we found our chests several miles away, high and dry on the beach of Ocean Island.

"Nine days only remained to us for the setting up of our photo-heliograph, and to make all preparations; six days only for preparing and testing our dry plates. The first fifty plates prepared were put on one side as untrustworthy, as on the morning after their preparation it was found that the brown, swampy, and ferrous spring water could not be employed, as it occasioned stains and precipitates. For this reason we began zealously to collect the rain-water, which came down in surprising quantities, and, moreover, distilled day and night the spring water of the place. As there was little time for working-up the silver baths, and for modifying and testing our collodion, the latter had to be used fresh—a circumstance of little importance, probably, in the wet process, but unfavorable to the preparation of dry collodio-albumen plates. The collodion, moreover, on account of the very moist condition of the atmosphere, betrayed an extraordinary tendency to lift from the glass, and a preliminary coating of rubber brought about staining, because it kept in the damp. The employment of this material had, therefore, to be abandoned, although among the glass plates were found some which had already been made use of.

"I now took my own chemicals in hand, my own collodion, and my old silver bath, which had served already for the preparation of dry plates, which I had brought with me for private work, and also in case of difficulty, should the other untested and, so to speak, unripe chemicals be found wanting. A new silver bath which I prepared gave beautiful wet plates, but was no good whatever, as I have said before, for the preservation of dry films, which all of them fogged on treatment therein. On the other hand, my private chemicals gave good clear plates. In the same way, the collodion brought with the expedition was all very well for wet plates, and of course worked more rapidly than mine; with dry plates, however, the new collodion always yielded dirty films, while mine gave clear ones.

As we employed distilled or rain water, both at the beginning and end of the operations, but could not employ such water throughout, I dipped the plates after sensitizing in a bath of distilled or rain water, and covered them with albumen solution without further ado. The film still contained silver, but this did not matter, as the albumen solution also contained silver, and the latter was then washed by pouring over it the brownish spring water. The silver albuminate in the excess of albumen was in this way simply washed off the plate without in any way injuring it or covering it with spots, and finally a rinsing with rain water ensued, after which the plate was set to dry.

"So far as time and the few glimpses of the sun permitted, we tested our plates, and prepared a series of one hundred films, for the depiction of Venus on the sun disc; these were for the most part produced with the chemicals I had brought with me from Dresden, the middle washing operation being omitted, and each plate labelled so that I might know it again. Some dry albumen which I took with me, and which had been prepared by Dr. Wolfrom and M. Bobzin, of Schwerin, proved to be in excellent condition; on the other hand, the fluid albumen treated with ammonia arrived in a decomposed state. The results I obtained with the dry albumen were equal to those secured with fresh white of egg.

"The drying of the plates in an atmosphere saturated

with moisture, like that of the Auckland Islands, was of course a very long business. In order to dry the last batch of fifty, ready for work at the proper time, I myself tended the fire in our little stove from one o'clock in the morning until ten. The well packed dry-box, furnished with a fresh supply of chloride of calcium, had to be placed in the vicinity of the stove, to let the films become properly dry, and if this was not done, three days did not suffice to drive off the moisture. The collodio-albumen dry plates dry more slowly than any other films, and the longer the collodion is in drying, the worse are the results obtained, its keeping and sensitive properties both suffering.

"I must not here forget to state, in the interest of any future expeditions in which photography is to play a part, that whatever may be the advantages of a dry process over the ordinary wet process—and these advantages are marked—such advantages become illusory under certain circumstances, to wit:

"1. When the photographer entrusted with the operations is not so familiar with the particular dry method as he is with the wet.

"2. When the chemicals to be employed have not been a sufficiently long time in the photographer's possession to allow him to work and become familiarly acquainted with them.

"3. When the technical superintendence and arrangement of the photographic section of the expedition are not delegated to one skilled person.

"Finally, it is impossible to prepare at once, from chemicals newly come to hand, trustworthy dry plates. For many purposes, and especially for spectroscopic work, the use of wet plates is always to be recommended, because these are more easily acted upon in the first place by the rays of light. In securing photographic pictures of the sun's disc, on the other hand, dry plates are preferable, and in this case it is always well to make a few test experiments with wet plates from time to time to prevent accident."

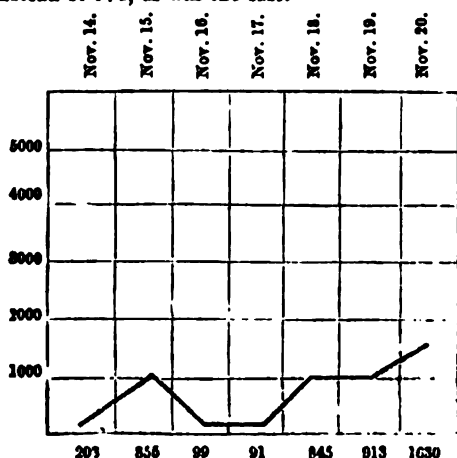
(To be concluded.)

METEOROLOGICAL REPORT SHOWING THE DAILY VARIATIONS IN THE QUANTITY OF LIGHT RADIATED FROM THE SOUTHERN SKY OF BLACKPOOL.

BY D. WINSTANLEY, F.R.A.S.

THE daily average of light again has risen, being for the past week as 662 units to 598 for the week preceding, and the curious line to which I have called attention more than once again appears.

I notice in last week's issue one of the figures has been dropped, the amount of light on Nov. 7th being given as 74, instead of 974, as was the case.



PRACTICAL NOTES ON VARIOUS SUBJECTS.

BY CHARLES WALDACK.

CARBON AGAIN—HALATION—PRINTING ON CANVAS.

Carbon Again.—The Ghent Section of the Belgian Photographic Association had a meeting last Tuesday afternoon at the laboratory of Dr. Van Monckhoven to witness the operations of printing in carbon. The meeting was the largest yet held, and great interest was shown by those present. The main feature was the development on a collodionized glass. As this mode of operating is one of great certainty, and little liable to accident, and as it has not, to my knowledge, been published, I will give a short description of it. In order to shorten operations, the doctor develops as many prints at a time as can be transferred on a glass plate 20 by 24. This is rubbed with a solution of wax in benzine, so as to leave a very small quantity of wax on the surface; or it can be flowed with a very thin solution of the same kind as described by Mr. Sawyer in a late number of the NEWS. After drying, the plate is flowed with plain collodion, allowed to set, and washed in a dish of water, to debarrass it of the alcohol and ether. The collodion used by the doctor is thinner than negative collodion, and is slightly coloured with indigo, to neutralize the yellow tint of the transfer paper. After washing, the plate is laid down flat, and covered with the insulated carbon tissue, which has been previously immersed in water for about a minute. All these operations are done in full daylight, taking care, however, to keep the gelatine surface shielded from the light while transferring it from the box to the water. A sheet of rubber cloth is laid down on the back, and the water is expelled by means of a squeegee, working at first from the centre to the edges. The plate is then set up, and allowed to stand for some time before developing. The developing is done in water at about 100° Fahrenheit, which is caused to flow forward and back over it, until the paper serving as a support to the gelatine becomes detached. When all the soluble gelatine has been removed, the plate is rinsed with a stream of cold water, and put in the alum solution. The alum solution is a strong one, and a few drops of sulphuric acid are added to it, in case the washing waters should contain carbonate of lime, to prevent the decomposition of the alum, and the precipitation of alumina on the film. After this the film is generally allowed to dry, before transferring to paper. The doctor, however, has discovered a means of depriving the gelatine of the water by which it is permeated, and thus bringing down the relief in a few minutes. When this process, which will be published shortly, and which we do not feel at liberty to divulge, is used, the transfer paper can be applied immediately. The transfer paper is soaked for a minute or two in hot water, laid down on the cold plate, and the excess of water removed by means of the squeegee. When this is strictly observed, the image will detach easily when dry. The prints on being detached from the glass have a glacé appearance, which, however, disappears when they are mounted on cardboard. In case it is desired to retain the glacé appearance, several thicknesses of transfer paper can be put on the back, thus forming a card of sufficient thickness, or a thin cardboard can be pasted on with gelatine. The bichromate solution used is 1½ per cent., or 7 grains to the ounce. It should be renewed frequently, an old solution giving flat pictures. This, however, when hard negatives are used, may be an advantage. In a short time Dr. Van Monckhoven will publish a pamphlet, giving a detailed account of his experience in carbon printing. The immediate result of this *seance* has been, that all the principal establishments here are prepared to adopt the process.

The Fringe or Halo.—This is a thicker deposit of silver on the edge of the high-lights, where they border on a dark part of the negative. Short exposure conduces to it, but prolonged exposure does not always remedy it. It is sometimes met with in portraits,

a light fringe, lighter than the background, next to black coat or dress. It makes its appearance in landscapes, where the sky line is formed of dark foliage. It is particularly annoying in transparencies made in the camera, and in negatives made from transparencies. I have not met with a satisfactory explanation of this occurrence. To be informed that it is owing to too much light, or to the lens, or to the action of the light spread through the particles of the film, leaves me as much in the dark as before. My opinion is that it is one of the defects inherent to the wet collodion process, and that evil is produced in the development. Suppose we develop a plate in which a light outline contrasts on a dark ground. The parts of the latent image which have been strongly acted upon by the light will attract the particles of silver with great energy, and when they are next to a dark background, where the attraction is very small, there will be a tendency to take up not only what ought properly to be deposited there, but also some of the silver which ought to have gone to the neighbouring dark parts. If I am right in my supposition, the remedy ought to be in the adoption of a process in which the image is formed by the decomposition of the haloid silver compound present in the film, and not by the nitrate of silver which permeates it. Such process is the bromide process, emulsion or with the bath, wet or dry, with alkaline development. The matter is one of great interest, principally to those making enlargements.

A simple process on painter's canvas.—The process I intend to give is one I have used with great success for many years. It is principally adapted to print from enlarged negatives in the printing frame. For solar camera printing I prefer a process by development, which I will give at some future time. The canvas I always used is Winsor and Newton's smooth. No doubt it would be successful with other kinds. Rub the canvas smartly with the half of a lemon, without squeezing it, until the juice takes everywhere. Then remove the fibrous parts which may adhere with a stiff brush or a piece of cotton flannel, and let dry. Next cause to flow over it, by means of a bent glass rod, a salting solution from 2½ to 10 grains strong (the weaker the negative, the weaker the salt), and dry again. The silvering is done in the same manner with a 40-grain silver solution. After drying, fumigate with ammonia, and print as soon as possible, as the surface is apt to become yellow. The print should be less overdone than on albumen paper. The image can be toned by flowing a weak gold solution over it; or, if one is indifferent about the colour, the toning can be dispensed with. The fixing is done by flowing hypo over it. Wash well under a tap, and hang up to dry.

BUST PICTURES WITH GREY BACKGROUNDS

BY J. UNGAR.*

DESPITE the competition of other printing processes, albumenized paper still maintains its supremacy in photography for the printing of portraits. It cannot be denied, too, that there is no process which is so practical, and at the same time so charming in its results, as the albumenized paper printing method. But if we are rather kind to its faults—which are, by the way, many in number—it is not so much by reason of our love for the process itself, as that we have no other to help us.

One of its main defects—that of growing yellow in the whites of the picture—it has been sought to annihilate by mounting the picture upon a card yet more yellow in tint, as also by employing a rosy-hued paper. But, nevertheless, especially in the case of vignettied bust pictures, where there is a large surface of white, the yellow tone soon becomes disagreeably visible, for even in the case of tinted paper the aniline fades in time.

* *Photographisches Correspondenz.*

For this reason some efforts have recently been made to have a grey background instead of a white one in vignettied bust pictures, the effect being not only more artistic and agreeable, but also more plastic, as there are then no other whites but those in the high lights of the picture. The impression conveyed by these prints is that of an old engraving, for the tone of the paper reminds one of that upon which crayon sketches are made, in which the high lights are put in with white chalks.

It is true that a graduating tint of grey may be put in by hand, but when a large number of pictures are to be printed, the process then becomes a tedious and time-taking one. For this reason a method was looked for which should furnish a background at the same time as the photograph was taken, and it was at last suggested that an oval mask should be placed between the model and the lens, made of white cardboard. This arrangement fulfilled its object so far that a graduated picture in grey is really produced, but only if everything is very precisely arranged and fixed. The preparations necessarily take too long a time, however, and the least pushing of the oval out of position, or the slightest movement of the lens to the right or left, is enough to militate against the result. The method has, too, another drawback. The reflecting rays from the white paper fall almost vertically upon the lens and the sensitive plate, and the result is to a certain extent a fogging of the picture. If the first half of a double plate is exposed in this way, and the second half after the cardboard has been removed, this is at once apparent.

Another simpler and more certain method, and one which is far more easy to carry out, may be mentioned, and it is one, too, which permits the middle field occupied by the bust to remain as clear as possible. A cylinder is constructed of sheet iron which is varnished internally, and this fits on to the brass tube in front of the lens, and forms a continuation of it. A tube made out of white cardboard will, of course, answer the same purpose. The cylinder should have a length of about a third more than the focal length of the lens, measured from the front lens, which may be easily determined by focussing upon a model. This is the whole of the preliminary arrangement necessary for the first and every succeeding picture, as, in case of need, all that requires to be done is to push the cylinder a little forward. The object, having been properly focussed, is then depicted in the camera in the ordinary way, and the development conducted as uniformly as possible. The result is a picture which runs very gradually to the edge into a soft grey, while in the centre of the picture, if everything has been done as it should be, there will not be found the trace of any fogging. If it is desired that there should be at the border a tint of a lighter character than that produced, then a vignette mask of very transparent paper is placed in front during the operation of copying.

The process, as will be seen, therefore, is easy and simple to work, and its results are pleasing and artistic.

TECHNICAL NOTES.*

Retouching varnish.—A varnish made up as follows, applied to the negative after it has received a coating of gum-water, materially facilitates the action of the retouching pencil:—

Ether	...	...	100 cub. cents.
Shellac	...	...	1 gramme
Sandarac	...	...	6 grammes
Mastic (in drops)	...	...	6 "

After the above substances have been made into a solution, there is added ten cubic centimetres of benzole. Poured cold upon a glass plate, the varnish yields a matt film. If the grain is not fine enough, then a little more benzole is added. Glass treated with a film of this varnish may be used as a focussing screen, or in the preparation of transparent pictures.

* *Bulletin de la Société Photographique de Toulouse.*

Removing silver stains from clothing.—This process succeeds particularly well upon stuffs which have been washed several times. A saturated solution of chloride of copper is prepared, and the soiled material is put into it for a few minutes, according to the depth of the stain. Afterwards the stain is removed by rubbing it with a crystal of hyposulphite of soda dipped in a mixture of water and ammonia. If chloride of copper of a neutral character is employed, the colour of the material is not altered in any way. In any case, however, the process may be repeated if the stain does not disappear the first time.

Clearing a solution of tannin.—The kaolin earth is washed with a mixture of one part of sulphuric acid and nine parts of water, and after soaking in distilled water for a quarter of an hour, it is permitted to dry. The most concentrated solution of tannin is, by means of this purified kaolin, very rapidly clarified and bleached.

Developing holder.—The practice of holding a plate in the hand during the operation of development not only causes stains upon one's hands, but leads also to unequal development of the image. Many systems have been proposed from time to time to get over the difficulties in the operation, but none of them have seemed free from fault. The four-cornered frame and the pistol-shaped holder allow so much of the developer to escape that it is necessary to apply three or four doses of the liquid. The pneumatic instrument has the objection in warm weather of creating a transparent circle in the middle of the plate.

A better and more simple plan may be adopted. A tube of cardboard is made some eight centimetres in diameter and twelve centimetres long, and this is rendered hard and waterproof by the application of marine glue or shellac varnish. The plate to be developed is put upon this tube, and then it can be conveniently held in the hand. As the tube is open, there is no circular stain formed upon the plate; and as, moreover, the margins of the plate are quite free, no more developer need be applied than if the plate were held in the hand. The developer flows quite freely under these circumstances, and the liquid makes the plate adhere firmly to the holder.

THE PRESS AND THE EXHIBITION.*

(Morning Advertiser).

THE finely-lighted room of the Society of Painters in Water Colours, 5, Pall Mall East, is again used by the Photographic Society of Great Britain for their annual exhibition. Although some of the leading photographers, whose works have been greatly admired in previous years, are absent on the present occasion, still there is no lack of exhibitors, and the exhibition may, on the whole, fairly take rank with any that have preceded it. There has been no startling photographic discovery during the year—or, at least, there is no evidence of anything of the kind here—but in every part of the room there are gratifying proofs that the art has neither retrograded nor remained stationary. Positive progress may be traced in the excellence and perfection of most of the works. The different processes with which the scientific photographer has made us familiar have been further developed, and are now better understood than formerly, when, as new discoveries, they were rather experimental than definite and fixed. Take, for instance, the development of the process of autotype and of carbon enlargement, and it is hardly conceivable that such vast progress could have been made in such a comparatively brief interval of time. It may not be that any new chemical applications of moment have conduced greatly to this result. The confidence which the operator acquires by experience, and his superior technical advantages, do much to improve the finished outcome of his art. Blemishes of one kind and another are steadily but resolutely conquered until, by degrees almost imperceptible, that quasi-perfection of which the present exhibition is the admirable exponent is attained. Amongst the most noticeable specimens, both on account of their largeness and the completeness of their details, are those exhibited by the Woodbury Permanent Photographic Company. These are carbon enlarge-

ments from small negatives, and are most successful reproductions. Messrs. Spencer, Sawyer, Bird, and Co. are equally *au fait* at the autotype enlargement process, and exhibit several charming examples. From the Royal Engineer School of Photography, Chatham, there are many excellent specimens, marked by much tenderness in the gradations, and free from insipidity or tameness. One of the finest photographs in the collection is by Mr. B. B. Turner, Tulse Hill. It is entitled, "The Head of the Lake," a scene in Lo-e-ly Park, and is as perfect a piece of woody landscape mirroring as could possibly be desired. The work is enlarged by the autotype process from a Talbotype paper negative, a copy of which was shown in the first exhibition of the Society, in 1864. Messrs. A. and J. Boal are also clever photographers of natural scenery, and their "Wayside Bridge"—a large work taken direct from nature, and not enlarged—has all the charm of a polychrome. Indeed, it is surprising how the almost countless gradations and tints which range between the highest light and the deepest shadow, when gathered up, as it were, by the magic of the photographer's lens, and printed on paper, present to the eye so vivid a representation of the object or the scene before which the photographer places his instrument. Yet so it is, and from this fact the artist-painter may learn that colour, although indispensable in a work of realism or of high imaginativeness, is not *per se* necessary to a complete reproduction of an object of still life, or a bit of nature. Nothing could be more satisfying than some of the monochrome rendering of natural phenomena contributed to this exhibition. The studies of "Cloudland"—charming sky effects by Messrs. B. Wyles and Co., of Southport—might doubtlessly be more intelligibly interpreted by the polychromatic touches of the artist's pencil, which would tone down the abrupt passages from black to white. Although the views—taken direct from nature, it is presumed—are highly creditable specimens of the art, they are less satisfactory as pictures than the more ordinary landscape effects. In the intensity of shadow-tints and the brilliance of the high-lights the contrast is too violent. Form only is preserved; the eye is required to fill in the gorgeous tints of cadmium, madder, and vermilion; and it wants a skilful artist to distribute these aright. The larger part of the collection consists of landscape and out-door studies, but there are some high-class examples of portraiture which call for a few words of notice. Those by Messrs. Cooper and Moorby, of Hull (three-quarter lengths), are very exquisite, and cannot fail to command attention. Messrs. Robinson and Thompson, of Liverpool, though working in a different way, produce equally happy results in their larger, well-lit photographs of Miss Rose Hersee and Carl Rosa, in which the chiaroscuro is highly successful. For softness and effective distribution of light and shade there is nothing finer than the full-length portrait exhibited by M. Hugo Theile, of Dresden, and photographed from life by the wet collodion process. The mesotint enlargements by Mr. G. Croughton, Lowestoft, are also good examples. There are some fine life-like photos in the Lambertype process, permanent unretouched enlargements from cabinets, by M. Leon Lambert, Greenwich, which will repay close scrutiny. Mr. R. Faulkner, Kensington Gardens Square, contributes a frame of instantaneous photographs, chiefly of children in different attitudes, and wearing vastly different expressions, together with some highly finished and masterly enamel portraits, the softness and repose of which would have defied both the patience and skill of the miniature painters of a century ago. Mr. Valentine Blanchard, *facile princeps* of photographers, is content to be represented by a single example, and that a telling one of Salvini, whose head fairly stands out in relief from the background, so judiciously is the lighting managed. The advice of Sir Joshua Reynolds to the students of the Academy was to take care of the shadows, and leave the lights to take care of themselves. Photography seems to have reversed that rule. Lights first; shadows are the necessary and natural corollary of them. By some sly process, however—perhaps by the mere cleverness which practice begets—Mr. Blanchard, while securing the lights, and distributing them with well-balanced judgment, takes care that the shadows also shall not become their own nurses. The tenderest half-tones melt away as under the hand of the skilful artist, and the result is most flesh-like and natural. A less accomplished style of art is that exhibited in the two frames of heads, phrenological and physiognomical studies, by Mr. S. G. Payne, Aylesbury. These are taken from the inmates of a county gaol, and are interesting, but not inviting specimens of humanity. Mr. H. Garrett Cocking, of Peckham, the Stacy Marks of photographers, sends two humorous subjects, of which preference is given to "The Knight of the Bath," in which there is a *double entendre* that the boy's attitude clearly and cleverly enforces. "Sam

* This notice (which has been standing over on account of the pressure on our space) completes the collection of the opinions of the press at large on the exhibition. Our custom to place on record.

Weller," the companion picture, is not so successful. There are many other works that deserve notice, especially those by Mr. Crawshaw, Cyfarthfa Castle; Messrs. W. and D. Downey, Pimlico; Messrs. Lombardi and Co., Pall Mall East; the late Mr. Rejlander; Captain Ross, Portsmouth; Mr. J. S. Stoddart, Margate, who contributes some vivid coast and sky effects; Mr. Sutcliffe, Tunbridge Wells; and, in fact, it is difficult to know upon whom not to bestow praise.

Correspondence.

ERROR IN EXHIBITION CATALOGUES.

SIR,—I shall be obliged if you will kindly allow me, through the medium of your journal, to set the public right with respect to a picture in the late Photographic Exhibition, 5, Pall Mall East.

No. 180, portrait of Mr. Paul Turner, photographer, Chesterfield, hung with the Autotype Company's contributions, was *not* an autotype, neither was it a contribution of the Company at all. The portrait was an enlargement worked up in crayons by me, but was, through inadvertence, hung and catalogued with their works. The picture, I am told at the Exhibition, was favourably received by the profession, and whatever advantages may accrue from its being hung ought to go into the right channel. The fact of my picture being hung at all only came to my knowledge when I went to the Exhibition to see about its removal, or I should have endeavoured to rectify the matter earlier.

Trusting you will allow me to right myself with the public, I have the honour to be, sir, your most obedient servant,

E. W. ANDREWS.

8, Sussex Place, Osnow Square, South Kensington, Nov. 22nd.

VELOCIPEDE FOR PHOTOGRAPHERS.

SIR,—Allow me to inform "W. W. M.," in reply to his question in your journal for last week, that he would find either a bicycle or tricycle very useful for the purpose he wants, if the articles he wishes to convey are only weighty and not bulky. I should recommend the *Paragon Bicycle*, 44 or 46 inches (makers, Wyatt and Roberts, of Coventry). I have one of their make, a 50-inch, and I find it invaluable. If what he wishes to carry is of any greater length than 2 ft. 6 in., I should recommend a tricycle, which he can obtain from the same firm.

I beg to enclose you a photograph which I have taken of my own machine.

As I am an amateur of some few months' standing only, I should be pleased to receive your opinion upon it,

COVENTRIENSIS.

[The photograph is a very good one, of a light elegant looking bicycle, but from its height and lightness almost as alarming looking to the non-expert as must have been the chesnut horse upon which George Augustus Sala was asked to join a military reconnaissance during the American war, and which, to his startled imagination, appeared to be blood red, and at least fifteen feet high!—Ed.]

SIMPLE MODE OF EMBOSSEING CAMEOS.

SIR,—I read an article in the last number of the *Photographic News*, that Mr. Foxlee had exhibited a single contrivance for embossing cameo vignettes, which I think a very ingenious idea; but at the same time I think an improvement upon it is by making a small box the exact size of your carte mount, and about half an inch in height; you then substitute for the glass plate a bed of india-rubber not more than three-eighths of an inch thick, which is to be laid at the bottom of box; then lay on your snuc shape, and then your carte mount, and then, instead of using the glass stopper to make the impression, you use a teaspoon; you then get a raised surface equal to any procured with the best embossing press. If you use the stopper you do not get such an even surface as you do with the spoon.—I am, sir, yours respectfully,

STEPHEN BONE.

Bermondsey, Nov. 22nd.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE annual dinner took place in the Peacock Hotel, Newhaven, on the evening of Friday, the 19th inst. Dr. THOMPSON, the president, occupied the chair, and Dr. SIDEX, one of the vice-presidents, acted as croupier.

The dinner was served in Mrs. Main's best style, and this is saying a good deal, as there are few things in connection with Edinburgh more enjoyable than a first-class Newhaven fish dinner.

After full justice had been done to the good things provided, and due honour had been given to the loyal and patriotic toasts,

The PRESIDENT rose to propose the toast of the evening—the Edinburgh Photographic Society. He said, as there were none but members present, any eulogium that he might pass upon the Society would seem something like sounding their own praise, and as "blowing his own trumpet" was a somewhat distasteful operation, he should content himself with much less than under other circumstances he would have thought it his duty to say. Those who regularly attended the meetings of the Society, and all who read the reports which from time to time appeared in the photographic journals, could not fail to understand that it held a high position amongst the kindred institutions of the country, and would see that it had done, and was still doing, much good work in connection with the photographic art. The Society, he said, was never in a more flourishing condition, but there was still much to be done. He would therefore impress upon all present, and through them on the whole body of the members, the duty of continued action, not only that the present position might be maintained, but that, if possible, still greater success might be achieved. This could only be done by each putting his shoulder to the wheel, and acting as if that success depended on himself alone.

The toast was enthusiastically responded to, and was followed by "Kindred Institutions Everywhere," "Photographic Literature," "Absent Members," "Former Office-bearers," &c., the toasts and replies being interspersed with songs and recitations. A rather amusing incident occurred in connection with the toast of "Absent Members," proposed by Mr. DOBIE. Just as he sat down, a waiter entered the room, and handed a telegram to the president, which, on being opened, was found to be from Mr. W. Neilson, regretting his inability to be present, and begging to be allowed to reply to the toast.

Mr. W. H. DAVIES, while speaking to a toast, said that it might not be generally known to the members that the council had been for some days considering the desirability of getting up a photographic exhibition. He was sorry to say that while all agreed as to the advantages which would flow from such an exhibition, they had been reluctantly compelled to abandon the idea for this year; but they had resolved that an effort should be made to open one in December, 1876, on a scale not hitherto attempted in Edinburgh. For this purpose a guarantee fund was absolutely necessary, and he was glad to say that from the first two gentlemen who had been called upon, a sum of twenty pounds had been subscribed. He knew the members pretty well, and, from that knowledge, he had no doubt that an ample fund would be readily guaranteed.

Photographers from every part of the country would be invited to become exhibitors, and he hoped that the members of the Society, both professional and amateur, would begin early in the season, determined to show that Edinburgh should hold her own against all comers.

The proceedings were brought to a close with "Auld Lang Syne," at ten o'clock.

Talk in the Studio.

OBITUARY.—THE LATE O. B. VIGNOLES.—We record with much regret the death of Charles Blacker Vignoles, F.R.S., &c. Mr. Vignoles, who was recently president of the Institution of Civil Engineers, was one of the originators of the Photographic Society, and was for many years on its council and one of the vice-presidents. The first suggestion for the establishment of a photographic society originated with Mr. Vignoles, and the early meetings at which the project was matured were held at his rooms in Trafalgar Square. Early in life he was in active service as an officer in the army, but eventually devoted himself to engineering, and obtained a distinguished position. He early perceived the varied possi-

bilities of photography, especially recognizing its value as a recorder of the weekly progress of building and engineering work in the absence of the engineers, and Mr. Roger Fenton produced the first progressive photographs of a bridge in course of erection, as records, to be forwarded to Mr. Vignoles, who was absent. He died at Hythe on the 17th inst.

OBITUARY.—We announce with regret the death of a gentleman well known as a skilful portraitist in Brighton, Mons. Boucher, who died a few days ago after a very short but serious attack of pleurisy. M. Boucher was an occasional exhibitor of fine examples of portraiture at the Photographic Society's exhibitions.

URANIUM IN THE NITRATE BATH.—A correspondent calls our attention to the fact that the large instantaneous photographs exhibited by Col. Stuart Wortley at the South London Technical Meeting were from dry plate negatives prepared with a bath containing uranium, and not from wet plates, as our recent notice implied. We certainly understood from the announcement made, that the negatives were prepared in a bath containing the uranium salt, that wet plates were meant, as no allusion to dry plates was made. The results for dry plates were certainly very striking and excellent.

BENEFIT OF THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—On Thursday evening week the Photographic Exhibition was open for the benefit of this Association. A number of visitors attended, and the profits will make an addition to the funds of the Association. The following evening the Exhibition closed finally.

To Correspondents

*** **THE YEAR-BOOK OF PHOTOGRAPHY FOR 1876.**—This annual is now in active preparation. As our readers know, it owes the large esteem it now possesses throughout the world to the fact that it is a practical résumé of the observations of many minds, the experience of many workers, and thus becomes a reflex of the actual position of photography in its latest state of progress. To secure this we are indebted to the communications of all the able workers and shrewd observers, both in the ranks of professional and amateur photography, and we now appeal to each and all of our readers for communications of hints and suggestions, however brief, resulting from their practice and observation. The early receipt of copy from our friends will be esteemed a favour.

BEALMONT asks, "Why does a brown-toned photograph copy so much coarser than a grey-toned print?" In answer we should ask, "Does it do so?" Assuming that each print is of equal force and harmony of tint and gradation, and each equally perfect in surface, we should expect one to copy as well as the other. It may possibly, or even probably, happen that the grey-toned print is more harmonious in tint, being more thoroughly toned throughout. It generally happens that the half-tones in the image, consisting of thinner deposit of metal, are toned first and assume a greyish tint, whilst the deeper tones remain brown. In this case, whilst the general tone of the print is warm or brown, the more delicate half-tones are grey, and possess less actinic value, so that, in copying, the reproduced image will possess less gradation than it would have done if the original had been uniform and harmonious in tint. 2. The reasons for making portions of a studio at the side and top near the background opaque are very simple. In order to secure relief and modelling in a portrait, shadow is necessary as well as light; and the shadow is most effective, as a general rule, in the retiring portions of the figure. If the side light were, instead of being kept a little in front of the figure, allowed to fall full on the side of the figure and behind it, this shadow on the retiring portions would be lost; and the shadow on the opposite or unlighted side would be harsh and abrupt. If the top light were continued right over the head of the sitter, the top of the head would be lighted too much, giving the effect of a white patch, whilst black abrupt shadows would be thrown under the eyes, under the nose, and under the chin.

J. D.—Without knowing something more of the history of the print it is impossible to state the cause of the spots. They have very much the appearance of spots which are sometimes produced in silver prints from contact with the bronze powder used in what is called "gold" printing on the mounting cards. They might be caused by dust from a stove in which coke is burnt. They might be caused by particles of dust from various chemicals, such as chloride of lime, &c.

L. B.—The precise formulae of all commercial collodions are, as a rule, preserved trade secrets; the most that we can say with certainty in relation to the two you mention is, that they are bromo-iodized collodion.

A. A. CONSTANT READER.—Two or three variations in the mode of working are described in the article in question, and you do not state which you used. Transparent spots may arise from various causes: from turbidity in some of the solution; from dust, which in albumen processes is very difficult to avoid; and sometimes from imperfect beating up of the albumen solution.

A. B. C.—One of the chief defects in the prints you forward is under-exposure—that is the chief cause of the lack of detail; but the lighting is not good. There is no roundness or modelling. You do not shut out the light sufficiently on the shadowed side. Give a little more light on the lighted side, but well in advance of the sitter; shade the other side a little more, and give a little longer exposure.

H. A. H.—The Manual of Carbon Printing issued by the Autotype Company is an excellent practical work. It is the only work on carbon printing, in English, now in print. Our own work on the subject is out of print. The agent for Mangham's "Geyser" is Mr. Werge. You will find both addresses in our advertising columns.

J. M. N.—The cards you enclose are very excellent indeed for open-air portraiture. The style of vignetting, graduating into a dark instead of into a light margin, has not been much used, but is not new. It has been occasionally used in this country, and was made a speciality by Mons. Bergamasci, a distinguished portraitist in St. Petersburg, who sent out many fine cabinet portraits vignetted in this fashion.

STONE.—We do not think that you have any reason to fear injury to the photograph from treatment with a solution of silicate of potash; but we doubt whether it will fix the paste sufficiently to permit a print so finished to be sent out safely without a glass over it. Its preservative action on fresco painting depends on causes altogether absent on a pastel painting on paper. We should regard it as an imperative condition of executing a pastel painting that it must be sent out under glass, even if only bound at the edges with gummed paper.

ROMO.—Skies in landscapes are produced in various ways. Sometimes the clouds are painted in the negative. Sometimes they are printed on tracing-paper and placed over the negative. But the best method—indeed, the only method of obtaining really successful effects, is by a second printing from a second sky negative. A series of sky negatives with clouds of different kinds must be secured whenever good skies with fine clouds are available. The sky in the landscape negative, if not dense enough, must be made so by a mask, or by black varnish. This will make the sky space print white. The foreground is then covered by a mask, and a cloud negative selected and printed into the white space. A little care is necessary in joining the horizon, which in making is generally skylight vignetted into the sky. Care also is necessary to select a sky negative which harmonizes in character and lighting with the landscape.

W. A. C. A.—We have had no personal experience in winter photography on the Mediterranean; but we should think a thirty-grain bath would answer every purpose, as the only reason for using a stronger one in winter is the low temperature of our winters. You will generally find us at home in the forenoon. We shall have pleasure in seeing you.

H. M. M.—India-rubber varnish will make the bags gas-tight; but you will be able to purchase them more easily than make them. Bags of 30 by 24 by 18 inches are of five cubic feet capacity, and will probably answer your purpose.

G. G. B.—We fear that you will not do much good with the material upon which you have been experimenting, but had better throw it away. It is probable that considerable traces of iron remained about your first precipitate, and vitiated the value of subsequent operations. In your second attempt wash the precipitated gold with equal parts of sulphuric acid and water to remove all traces of iron. Then rinse in two or three waters, and add the aqua regia. When all is dissolved you can either evaporate carefully, or dilute to the proper strength, and neutralize with chalk when required for use.

J. WALTER.—The two landscapes forwarded are charming; the management of the clouds and sky most effective. Many thanks.

B. L. D.—The burnishers produce a finer surface than that usually obtained by the use of the rolling press. We cannot give a very definite opinion of the comparative merits of the various burnishers. We have used Westin's burnisher, and find its action exceedingly perfect, leaving nothing, indeed, to desire. Of the others we have no personal experience, and therefore cannot speak with authority.

R. M. F.—In copying a Daguerreotype it is desirable to throw a piece of black velvet or black cloth over the front of the camera and lens, to avoid the reflections, which are sometimes troublesome. We have at times found it an advantage to tilt the Daguerreotype a little forward, adjusting the camera so as to be parallel. A little trial and dodging are sometimes necessary.

F. M. SUTCLIFFE, FRANK HOWARD, E. DUNMORE, CAPTAIN REDIN, R. KENNEDY, W. H. WATSON, J. WALTER A. JOHNSTONE, and others.—Many thanks.

Several Correspondents in our next.

The Photographic News, December 3, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. BOOK PRINTING AND PHOTOGRAPHY—THE RETURN TO PAPER NEGATIVES.

Book Printing and Photography.—The progress recently made in phototype processes—that is to say, processes which furnish printing blocks in relief, such as can be printed from in an ordinary printing press with type—promises a new era in the publishing trade. As soon as we possess a cheap and effective method of reproducing black and white in this way, of copying type and wood-cuts, there will be little need of publishers setting up the type for a fresh edition of a work as soon as copies of it become scarce. For some years past we have, of course, been acquainted with methods which went a good deal towards what is wanted, and proved that we shall not be kept waiting for such a desideratum, for, judging from the doings of pioneers in this country, as also in France and Germany there seems a possibility of having what we require ere long. Dallas's process, as also that of Banks, both furnish very fine examples of phototype printing, and both these methods might perhaps be worked without difficulty by experienced hands. If publishers had at their disposal a ready and perfect method of reproducing works in type, we are quite sure that they would find much for the camera to do. Something has already been done in this way, we know, in Fleet Street, but the *modus operandi* is scarcely sufficiently elaborated. If books are to be reproduced in this way, it stands to reason that the type, although perhaps smaller, must be in every respect as clear and legible as in the original, otherwise the process is as good as useless, for no one would buy blurred and imperfectly printed books. The advantages of printing smaller editions in this way would be very great, for besides the saving in expense in securing stereotype blocks by means of photography, there would be considerable economy effected by the omission of reading and correcting the proofs, for we might be quite sure that if the reprinting has been done with the camera, no errors could possibly have crept in. Music-sellers already make use of the camera in reproducing scores; it is not, however, a phototype process, but some photo-lithographic method that they employ, which would scarcely answer in book printing. It is the custom at the present day, when producing small editions of dictionaries and works of reference, to abridge them considerably, and thus the work is often much reduced in value. With photography, however, a good clear edition could be reduced to half or a quarter its size, and be still distinctly legible with good eyes. In fact, what lithography did to cheapen the copying of manuscripts, photography ought to do in regard to book printing. If a lawyer wants but five or six copies of a legal document of any length, the law stationer finds it worth his while to put the writing on stone, and pull off the requisite number of examples; and in the same way the printer, when he stands in need of two or three hundred additional copies of a work, should be able to resort with advantage to the camera for furnishing them. There is no knowing yet awhile to what extent photography will be able to assist the ordinary printer, and it is only a wonder to us that the assistance has not been rendered before.

The Return to Paper Negatives.—Those who study the history of photography may see in the Warnerke process a return step in the direction of the old Talbotype or paper process. For some years after the use of glass was suggested for carrying the sensitive pellicle, Fox Talbot and his sterner disciples refused to give up their supple and unbreakable support, and comforted themselves with the notion that paper, if it had some serious drawbacks, was, after all, the right thing to use. We remember having seen an old-fashioned amateur still practising Talbotype, or a modi-

fication of it, ten or twelve years ago, and yet retain a vivid idea of the soft beauty of the negatives produced upon paper. Just what Mr. Warnerke has shown us to be feasible with the beautiful film he produces upon a paper basis, amateurs of twenty years ago fully believed would be attained; and though they had to admit the superiority of glass in many ways as a medium for the sensitive film, they never took to the change kindly. With what delight will these welcome back the supple films, and relinquish the perishable and risky glass, which they never could be made to like! These early workers in photography will be warm friends of M. Warnerke, as he will find, for he can now help them to realize their early ideas about the possibilities of the art. The roller dark slide which, in the days of Talbotype, had its counterpart among the apparatus of several ardent workers in these times, will be eagerly made use of by our elders, who will thus be able once more to make use of their dark portfolios, stored up in out-of-the-way places, where they have remained for the last score of years. We hope, too, that M. Warnerke's films will spare us in future the preparation of dry plates, for of all the tedious and uncertain operations upon which a photographer can engage, the coating, washing, and drying of collodion films is certainly the worst. If one has but a dozen or two such films to prepare, the labour involved is as much almost as would be required for double the number, so that unless a large quantity of plates are required, it is scarcely ever worth the photographer's while to prepare them himself. Photographers will not degenerate by having a bit of their work done for them, for, in the first place, dry plates can never take the place of wet ones, and, moreover, the development of a dry film cannot be undertaken by an unskilled hand. Dry plates are all very well in a good light; under these circumstances they may indeed be made as sensitive as wet films, giving images as good, with no longer exposure. But bad light will not answer with a dry film under any circumstances, an opinion in which M. Warnerke quite concurs. In a dull leaden afternoon light, such as we are experiencing at this time of the year, a tolerable negative may be secured with a wet plate in a light studio with forty or fifty seconds' exposure; but a dry film illuminated under the same conditions for minutes together gives a result not worth talking about. Of course there is a very essential difference between Warnerke's film paper and the old Talbotype material, but the mere circumstance of paper being once more resorted to as the flexible basis is an important connecting link which cannot be overlooked, for this is indeed the most valuable part about the new process. The circumstance, too, that the development of the image may be undertaken either upon the paper, or after the latter has been removed, is another scarcely less important feature of a process which we doubt not will, ere long, be widely used both by the professional and the amateur.

A PHOTOGRAPHER'S ADVENTURES IN THE SOUTH SEAS.*

At midnight, on the 8th and 9th December, we held a conference together, and came to the conclusion that everything was in order, excepting the weather, for the rain poured down in torrents until five in the morning. Then a big cloud rested over the Auckland Islands, which later came down in the shape of a fine rain. Every body was at his post anxiously waiting the result of our labours, now buoyed up with hope, now filled with fears. There was still a fine rain falling as but one minute failed to the time of the first contact. Then it became lighter, and the clouds divided in two portions. Dr. Schur obtained, by means of his large refractor, the first inner contact of Venus upon the phantom-like disk of the sun, for the latter was only visible at times between the clouds. Making use of these glimpses, I was successful in putting my photo-hello-

* Concluded from p. 573.

graphic instrument in position, and having once secured the sun, I never let it out of the instrument again. I succeeded in focussing the image during the rain, and keeping it in the field of the instrument, for the latter was, of course, in motion with clockwork, and in this way I was enabled to secure photographic impressions of the first inner contact of Venus. It was possible to see with the naked eye the little dark point of the planet upon the matt and shining sun disk. A few minutes later and the clouds dissolved, and then the sun shone out clearly for about four hours and ten minutes, during which period everybody worked with a will. At one end of the observatory the astronomers were silently busy; at the other we were engaged rather more energetically, every now and then the word "Attention" being whispered, followed by an instantaneous exposure. We exposed ninety-five dry plates, twenty wet ones, so that in all one hundred and fifteen pictures were taken of the sun's disk and Venus. No multiplying system, such as Janssen's, had been provided, and even my proposition to secure two images upon one plate had not been attended to. But a few minutes after the exit of Venus the weather again became dull, and we had a period of a week of bad weather—one unbroken spell of storm and rain.

On the very same evening I developed the first and last of the dry plates, and the developing operation was continued on the following days. Of every serviceable plate we secured at least one copy by contact printing on dry plates, and in this way obtained two perfect series of results, which were packed separately, each package containing, however, one original and one copy alternately. The two series were then furnished with duplicate tabular statements of the times and details which had been noted, and were finally despatched home by different routes, one going off to the east and one to the west. Our friends will be glad to hear that both packages have arrived safely at their destination without injury.

Our ship (the *Alexandrine*) we had determined to send to New Zealand for the purpose of comparing chronometers. This took place on the 12th December, and early on the 24th of the same month it made its appearance again off the island. In the meantime some grave rumours had sprung up in Australia respecting us, as no news had been received of our whereabouts. Captain Chandler, commanding the American corvette *Swatawa*, who had Professor Harkness on board, had determined, after calling at Chatham Island and Dunedin, to proceed to our assistance at the Auckland Islands, should we be in need of the same. We were delighted at these proofs of American goodness and humanity, and great was the joy of us all when the fine American man-of-war steamed in sight and dropped her anchor off the island. We could scarcely believe our eyes. As soon as we saw the stars and stripes we saluted it with the German flag, and soon after Captain Chandler, Professor Harkness, and the officers of the ship and members of the expedition landed, and we celebrated such a Christmas as will never be forgotten by any of us. We were by turns in our dwelling—which could scarcely contain our guests—and on board the *Swatawa*, where we were most amicably received and hospitably treated. A mutual comparison of chronometers was, of course, speedily made, and on the 25th of December the *Swatawa* steamed out of Port Ross, carrying with it our home letters. We remained on the island, however, until the 5th of March, as we had still a lot of astronomical work to undertake.

On the morning of the 6th of March our anchor was weighed, and we had nearly suffered shipwreck in port; for the vessel, being under no control at the time, drifted back towards the rocky Shoe Island; and it was only at the last moment that any way could be got upon the vessel. What between the storms and the calms, we were continually tacking, and advanced but little on our way. During the last few days, however, matters mended, and

we had beautiful weather on our arrival at Melbourne on the 22nd day, although favourable winds failed us throughout. On the Emperor's birthday, the 22nd of March, we ran up the German flag to the mast head, and celebrated the day by as good a feast as our fast-disappearing provisions would permit.

On the 28th of March, on Easter Monday, we arrived at Melbourne. The mail had sailed just three days before, so that, despite our efforts, we arrived too late. Our old ship, the *Durham*, had just arrived from London, having taken a turn round the world since she left us at Melbourne before. In this we sent back our instruments to London under care of two of our party, whence they were re-shipped on board a Hamburg packet for Germany. The rest of us embarked on board the P. and O. steamer *China* for India.

Our reception at Melbourne was most enthusiastic. Not only did the German Consul and Vice-Consul and the German societies afford us a most hearty welcome, but the Governor, the Mayor, the Observatory officials, and the University welcomed and fêted us. We made excursions into the interior of Australia, visited the natural beauties and wonders, the gold fields about Coalte Mine, Kangaroo Flat, and saw the deepest gold quartz mines, which are six hundred and twenty feet deep. On our return voyage we had an opportunity, too, of seeing Adelaide. In Albany, King George's Sound, we climbed Mount Clarence and saw a war-dance executed by the aborigines. At Ceylon I parted from my friends, who went direct home. I proceeded in the *China* to Bombay, and thence went by rail to Calcutta, where I spent an enjoyable fortnight. Captain Waterhouse, of the Ordnance Survey Office, received me in the most amiable manner, and I had an opportunity of seeing the photo-zincographic and photolithographic, as also the Lichtdruck, work done at his establishment. I had an opportunity of seeing the Venus pictures produced by Captain Waterhouse at Rosacker, and these, as also those taken at Hobart Town and Melbourne, showed that there existed an atmosphere around Venus, similar to the earth atmosphere. Altogether I had a very pleasant time of it at Calcutta, and with friends and countrymen. Returning to Bombay, I visited the Temple in the Island of Elephanta, took passage on board the P. and O. steamer *Bohara*, and returned via Aden, Brindisi, and Venice—home.

COPYING AND ENLARGING.

BY W. S. WHEELER.*

THINKING that a few hints on copying and enlarging from old pictures might interest the readers of the *News*, I offer my methods of managing this, as I think, the most difficult branch of photography, and requiring more study and practice to make perfect and every way satisfactory work. To enter into details would take too much of your valuable space, so I offer the following hints, which I trust will be of service.

Collodion.—That which gives the best general results I prepare as follows:

Alcohol and ether ...	...	equal parts.
Iodide ammonium ...	...	3½ grains to the ounce
" cadmium ...	...	1½ "
Bromide " ...	...	2 "
Cotton ...	...	5 "

Prepare in the usual way.

Developer.—Saturated solution of protosulphate of iron and double sulphate iron and ammonia, half and half. Prepare as follows:—Take of the above in equal parts (say three ounces), and add water enough to make it twenty grains strong by the hydrometer. To every sixteen ounces of this strength of solution add one and a half to two ounces of acetic acid No. 8. Fix with cyanide of potassium. In

copying Daguerreotypes, I notice that many photographers pay no attention to the buff marks or scratches. It is very easy to get rid of them, and, with a good Daguerreotype, make your copy almost equal to a life sitting. Take particular notice which way the scratches run, and when you are ready for copying, place the Daguerreotype on the copying stand so that the light will fall in the direction of the scratches; this prevents reflection, and gives you a smooth copy. To copy ferrotypes that are bent, I use a water bath. Any tinsmith will make you one. Mine is made as follows: A sheet of tin, ten inches long and eight inches in width; have the bottom and sides turned about an inch, and the seams soldered tight, and the edges grooved for receiving a plate of glass, which must be free from scratches or blisters; coat the tin with asphaltum varnish, and when dry fill the grooves with white lead and slip in the glass, letting it stand until thoroughly dry. To suspend the picture in the water when ready to copy, use a wire bent up in form of a dipper.

Ferrotype copies can be finished in India ink or water colours on the collodion film, by using a little more cotton in the collodion, which gives a heavy film. Varnishing improves the ink work, but it is not advisable to use it over the colour.

SKYLIGHT AND DARK ROOM.

BY W. A. ROBINSON.*

I ASK space in the News to offer those who have asked me at different times for my formulas, the following, which I think will be found good, if they are not new.

Negative Bath.

Ice water ...	...	12 ounces
Nitrate of silver crystal ...	...	1 ounce

Dissolve, and add 2 grains iodide potassium, shake thoroughly, let stand a few minutes, and filter; then add 1 drop c. p. nitric acid.

Collodion.

Sulph. ether conc. and alcohol ...	equal parts
Add	
Iodide potassium ...	2 grains
Bromide cadmium ...	2 "
Iodide ...	4 "

Gun-cotton 4 grains to each ounce alcohol and ether used.

To prepare the collodion, take the quantity of alcohol to be used, and grinding the iodide of potassium with a little water in a clean mortar, add to the alcohol and shake thoroughly, then grind in the iodide of cadmium, and lastly the bromide of cadmium, using the alcohol; shake thoroughly, put in the gun-cotton, and add the ether slowly, shaking after each addition. Let stand a few days before using.

Developer.

Soft water...	...	20 ounces
Potassium sulphate iron ...	...	1 ounce
Acetic acid No. 8...	...	3 ounces

Redeveloper.

I prepare and keep always ready for use the following:—

Pyrogalllic acid ...	...	24 grains
Citric ...	...	16 "
Water ...	...	16 "

To use, take 2 drachms of this solution, and add 6 or 8 drops of a 20-grain plain silver solution.

Fixing Bath.

Hyposulphite of soda.

Varnish.

The best and most economical negative varnish I ever used is made as follows:—

Alcohol ...	...	32 ounces
Venice turpentine...	...	2 "
Sandarac gum ...	...	3 1/2 "
Camphor ...	...	1 ounce

* Western Photographic News.

This varnish dries without heat, and requires no grinding for a retouching surface.

Photographers, I think if most of us were as well versed in posing and lighting as we are in the chemical manipulations, our work would be much more acceptable in an artistic point of view than it is now. I acknowledge that the late styles, the large heads and bust portraits, gave us little chance for display of our skill in composition, but we see the advent of the three quarter and full-length figures, and the opportunity presents itself for the use of our skill in artistic posing and lighting of the figure. You have little excuse for lack of knowledge when you can easily secure so many good examples. They are found in almost all illustrated works, even the cheapest having something worthy of example.

For those who have not the good fortune to possess it, I would recommend Robinson's "Pictorial Effect in Photography." It is a most valuable assistant in composition and lighting.

On the subject of lighting it is difficult to do more than generalize. I think that lighting the subject from behind, producing what we are pleased to call Rembrandt effects, has had its day, or should, at least. In the hands of many photographers this style of lighting has produced nothing but caricatures. Some have been successful, their skill in lighting and in chemical manipulation producing work of the highest artistic merit.

Acquire the skill to correctly light your subject, and judge of the proper effect without looking on the ground glass of your camera. Do not use too much top-light—plenty of side light, and soften the shadows with plenty of exposure. Do not intensify too much.

ON ABSORPTION OF LIGHT BY MIXTURES.*

THE intimate connection between absorption and dispersion of light has been variously demonstrated, and the investigations of Arago and Biot, as also more recent experiments, have shown that the specific refractive power of a mixture may be calculated from the refractive power of its constituent parts. In a recent paper to Poggendorff's *Annalen*, M. August Kundt has further estimated the relation of the absorptive power of a mixture to that of its component parts. In the case in which non-absorbent media were mixed with an absorbent substance, he found that an absorption band in the region of two rays in the spectrum was displaced towards the red end, the further the greater the dispersion of the added non-absorbent medium. This result was compared with the results of an experimental enquiry as follows:—

First, with reference to M. Kraus's assertion that the absorption band is displaced the more towards the red end, the greater the specific gravity of the solvent medium; to equal quantities of an alcoholic extract M. Kundt added equal quantities of the following substances (the density of which at 18° is stated: ether (0.718), alcohol (0.793), chloroform (1.500), benzol (0.865), oil of cassia (1.035), sulphide of carbon (1.293). With each of the mixtures the position of the absorption band of chlorophyll situated nearest to the middle of the red end of the spectrum was noted. It now appeared that the band was displaced differently towards the red end by each of the solvents, and the displacement was according to the order just given; with each substance greater than with the preceding one. Thus, contrary to M. Kraus's assertion, the position of the absorption band stands in no relation to the density. On the other hand, if we compare the dispersion of the solvents used for the red end of the spectrum, we find that this increases in the several bodies in the above order.

Further, equal quantities of cyanine were dissolved in different solvents, or a concentrated solution of cyanine in chloroform mixed with equal quantities of other solvent

* English Mechanic.

media. The substances used were alcohol, ether, olive oil, benzol, sulphide of carbon. The densities were as above; olive oil had a sp. gr. of 0.917. Here, too, the absorption band of cyanine was displaced towards the red by each solvent more than the preceding one, in the series just given, and a relation to the density was again not recognisable. That ether here displaces more towards the red than alcohol, while with chlorophyll the reverse is the case, is probably due to the fact that for red and blue rays, with alcohol, the dispersion appears to be greater than with ether; for rays in the neighbourhood of D, on the other hand, smaller; but further experiments are required on this. From various other observations the author's rule was confirmed.

"With reference to gases," proceeds M. Kundt, "which show absorption bands the above rule will no doubt hold without exception, since with them the specific refractive power of a mixture can be exactly calculated from that of the constituent parts. Only the question remains whether, if we mix, e.g., hyponitric acid gas with various other transparent gases, the displacement of the absorption bands is so considerable as that they can be observed. If that were the case we must infer, it seems to me, that also the bright lines which a glowing gas emits can be displaced in narrow limits by the mixture with them of another non-luminous vapour, or one giving a continuous spectrum. These displacements, however, are hardly ever perceptible."

In the foregoing it has been supposed that both substances, the absorbent and the non-absorbent, simply mix, without acting chemically on one another. We know of cases, however, in which a chemical combination of one absorbent substance with various others taking place, similar small displacements are observed.

The different salts of Didymium, such as uranic oxide and uranic oxide salts, and others, show characteristic absorption phenomena, and the position and arrangement of the absorption band alters more or less with the acid of the absorbing salt.

Bunsen showed, in the case of three salts of Didymium, that the bands are displaced more towards the red end the greater the atomic weight of the salt. We may suppose that here also the dispersive character of the acid conditions the position of the bands (though not perhaps in a very simple way). It would no doubt repay trouble to examine whether it is not those salts in which the absorption bands lie furthest towards the red end of the spectrum that present at the same time the greatest dispersion.

From the mixture of an absorbent and a non-absorbent substance we may pass to the mixture of two absorbent media. If to a liquid absorbent substance we add another absorbent medium, it is possible, at least approximately, to construct the absorption curve (the curve whose ordinates are wave-lengths, and its abscissae the exponents of refraction) of the mixture from the dispersion curve of the two mixed constituents, and so to obtain an idea of the absorption spectrum of the mixture.

Experiments on the absorption of mixed coloured media have been made by Melde, who has been led to some important results. To compare these with our mode of view, the dispersion curves of the substances used by him must be given as accurately as possible, which has not been the case; still I was able, by combination of dispersion curves, which in general correspond to the absorption character of the media employed, to verify a portion of Melde's results. It appears, on combining the dispersion curves in question, that, with mixture of two substances which have an absorption band near the same part of the spectrum, there do not appear two bands in the mixture, but one only, the position of which is midway between the bands of the constituents."

From the displacement of the absorption bands in mixtures, which, as has been shown, stands in intimate relation to the dispersion of the mixed substances, M. Kundt deduces also an explanation of the dichroism of doubly-

refracting substances. In such a medium generally the dispersion for the two portions of rays into which an incident bundle is decomposed will not be the same, and herewith the absorption for the two bundles of rays must also be unlike.

Lenarmont has shown that one may transform a previously colourless crystal into a dichroitic one, if one lets it crystallise out from a coloured solution, so that it takes some of the colouring matter into itself. We may, then, regard the crystal as a mixture of the colouring matter with the colourless substance of the crystal. Seeing, now, that the colourless crystal has in every direction (apart from the direction of the optic axes) two dispersion curves, the colouring substance has evidently been mixed with two substances of different dispersion. In these two mixtures the absorption bands can no longer be situated exactly alike; they must, according to the above results, be the more displaced towards the red end of the spectrum, the greater the dispersion.

I conclude, therefore, that in Lenarmont's artificially dichroitic crystals, the absorption band in the bundle of rays, for which the uncoloured crystal has the greatest dispersion, must be displaced towards the red end of the spectrum, as compared with that in the other bundle of rays.

Now, a very large number of the naturally dichroitic minerals equally owe their dichroism merely to a colouring matter accidentally mixed with the substance. For these dichroitic crystals the above rule must still hold.

It is, further, natural to suppose that the rule will apply also to those substances whose dichroism is not conditioned by a mere physically inclosed colouring substance. And thus, generally, in place of the rule which Balinet has enunciated for the various dichroitic substances, viz., that in them that ray is most strongly absorbed which is most strongly refracted—a rule which several physicists have shown not to be generally accurate—we should substitute the following:—In dichroitic substances the absorption band is in that bundle of rays for which the substance has the greatest dispersion lie nearer the red end of the spectrum than in the other bundle.

The evidence of how far the above views are actually in accordance with nature, as also the further working out of them, must be the task of special investigations.

CHEMICAL NOTES FOR YOUNG PHOTOGRAPHERS.

OUR Chicago namesake, the *Western Photographic News*, adopts the useful plan of giving occasional notes on the chemical constitution of various substances used in photography. It is true the information may be found in all comprehensive chemical books of reference; but as these may not always be accessible to many of our readers, occasional extracts may be found useful to beginners. We append a brief resumé of the nature, origin, and properties of nitric acid.

Nitric Acid (Acidum Nitricum). Formula, $\text{NO}_3=54$, sp. gr. 1.42.—Nitric acid, or aqua fortis, is prepared as follows:—To nitrate of potassa in coarse powder, contained in a retort, an equal weight of strong sulphuric acid is added, being poured in by means of a tube or funnel so as not to soil the neck. The materials should not occupy more than two-thirds the capacity of the retort. A receiver being adapted, heat is applied by means of a spirit lamp, the naked fire, or a sand-bath, moderately at first, but afterwards more strongly, when the materials begin to thicken, in order to bring the whole into a state of perfect fusion. Red vapours will at first arise, and afterwards disappear in the course of distillation. Towards its close they will be reproduced, and their re-appearance will indicate that the process is completed.

General Properties of Nitric Acid.—Nitric acid, so called from nitre, is a liquid extremely sour and corrosive. It was discovered by Lully in the thirteenth century, and its by Cavendish in 1784.

When perfectly pure it is colourless; but as usually obtained, it has a straw colour, owing to the presence of hyponitric acid. The concentrated acid, when exposed to the air, emits white fumes, possessing a disagreeable odour. By the action of light it undergoes a slight decomposition, and becomes yellow. It acts powerfully on animal matter, causing its decomposition. On the living fibre it operates as a strong caustic. It stains the skin and most animal substances of an indelible yellow colour. On vegetable fibre it acts peculiarly, abstracting hydrogen or water, and combining with its remaining elements. The general character of its action is to impart oxygen to other bodies, which it is enabled to do in consequence of the large quantity of this element, which it contains in a state of loose combination. It acidifies sulphur and phosphorus, and oxidizes all the metals, except chromium, tungsten, columbium, cerium, titanium, osmium, thodium, gold, platinum, and iridium. A trace of nitric acid has been detected in atmospheric air.

Anhydrous nitric acid is a solid substance, white and crystalline, but it cannot be prepared except by an expensive and complicated process.

The strongest liquid nitric acid contains one atom of water, and has a sp. gr. of about 1.5. If perfectly pure it is colourless. The principal impurities in commercial nitric acid are chlorine and sulphuric acid; also peroxide of nitrogen, which tinges the acid yellow. Chlorine is detected by diluting the acid with an equal bulk of distilled water, and adding a few drops of nitrate of silver—a milkiness, which is chloride of silver in suspension, indicates the presence of chlorine. In testing for sulphuric acid, dilute the nitric acid as before, and drop in a single drop of solution of chloride of barium; if sulphuric acid be present, an insoluble precipitate of sulphate of baryta will be found.

Photographic Uses.—Nitric acid, c. p., or chemically pure, is used largely for acidifying the silver bath for both negatives and positives, and also, added to silver solution, used for printing. Combined with muriatic acid it is called *aqua regia*, and dissolves gold in the preparation of chloride of gold. Nitric acid, commercial, is used for cleansing the glass plates for negative purposes, also in preparing pyroxyline. It is an active poison taken internally, the antidote being repeated doses of magnesia, and mucilaginous drinks in large quantities.

The following resume in relation to sulphate of iron is from the *Journal of Applied Chemistry*:—

Proto-Sulphate of Iron (Ferrous-Sulphate). (Copperas, green vitriol, protosulphate of iron) $\text{FeSO}_4 \times 7\text{H}_2\text{O}$.

This salt was probably already known to the ancients in an impure condition, and it is supposed to have been one of the ingredients of the *atramentum surtorium* mentioned by the late Roman writers as being used in medicine and in dyeing leather black. Its property of yielding a black colour with a decoction of nut galls was also known to them at a very early age.

It was formerly prepared to a large extent by allowing iron pyrites (a compound of sulphur and iron, FeS , which occurs plentifully in nature) to lie in heaps, exposed to the action of air and moisture. In this way the iron sulphide was oxidized to iron sulphate, $\text{FeS} \times \text{O}_4 = \text{FeSO}_4$, which was afterward leached out with water, and the liquid thus obtained concentrated and allowed to crystallize. In Europe this method is still largely used. In this country it is generally manufactured by dissolving old iron scraps in dilute sulphuric acid, the acid used being frequently that which has already been used in the refining of petroleum and other oils. When the acid is saturated it is filtered, slightly acidulated, and concentrated till it is covered with a pellicle. It is obtained in greenish crystal, which contain

Ferrous sulphate	...	...	...	54.67
Water	...	...	...	45.33

100.00

If a concentrated aqueous solution of ferrous sulphate is precipitated by alcohol, the salt has a white colour. Ferrous sulphate has an inky, astringent taste, and the crystals, exposed to the air, lose water, effloresce, and are gradually converted into a yellowish powder—basic ferric sulphate. Solutions of ferric sulphate which are in contact with the air are also gradually oxidized, and precipitates of basic ferric sulphate form in them.

The following table shows its solubility in water. It is noticeable that its solubility does not increase uniformly, and that it reaches its limit below the boiling point of water at 87.5° C.

{100 parts of water at 10° C.,	{dissolve 60.8 parts of $\text{FeSO}_4 \times 7\text{H}_2\text{O}$.
15°	69.8
25°	115.1
32.5°	152.2
46.25°	227.1
60°	265.9
70°	253.4
83.75°	269.8
90°	370.8
100°	382.9

As prepared in this country, copperas is generally quite pure. Many dyers, however, entertain curious prejudices, and prefer copperas which shows somewhat brown, taking such appearances as the sign of age and complete saturation. The manufacturer, however, can produce this appearance in a very simple manner, even in very recently prepared copperas, by sprinkling a little lime over it. Good copperas should be dry, rather of a dark than light green colour, and free from copper, alumina, and other impurities. If a bright piece of iron is introduced into a solution of copperas containing copper, the latter is precipitated on the iron, staining it red. Copperas may be tested for alumina by oxidizing the solution with nitric acid; it is then precipitated with pure caustic potash or soda, and filtered. To the filtrate add solution of sal ammoniac, and boil for some time. The appearance of a white gelatinous precipitate indicates the presence of alumina.

Copperas is used as a disinfectant in the manufacture of ink, in dyeing black, grey, madder purple, in the cold vat, in the manufacture of Prussian blue, &c.

Hydriodic Acid (Acidum Hydriodicum).—Formula, HI = 128, sp. gr. 4.443.

Preparation.—Place in a small retort ten parts of iodide of potassium with five parts of water, and twenty of iodine; then drop in, cautiously, one part of phosphorus cut into small fragments, and apply a gentle heat. Hydriodic gas will be extracted abundantly, and may be collected, by displacement, in dry bottles. It is reduced, under strong pressure, to a yellowish liquid, which freezes at 60°. Another method of preparation is as follows:—Iodine, in fine powder, a troy ounce; distilled water, a sufficient quantity; mix thirty grains of the iodine with five fluid ounces of the distilled water in a tall glass-stoppered bottle, having the capacity of half a pint, and pass into the mixture hydro-sulphuric acid gas until the colour of the iodine entirely disappears and a turbid liquid remains. Detach the bottle from the apparatus employed for introducing the gas, and gradually add the remainder of the iodine, stirring at the same time. Then re-attach the bottle, and again pass the gas until the liquid becomes colourless. Decant the liquid into a small matrass which is nearly sufficient to fill, boil it until it ceases to emit the odour of hydro-sulphuric acid, and filter through paper. Then pass sufficient distilled water through the filter to bring the filtered liquid to the measure of six fluid ounces. Keep the liquid in a well-stoppered bottle.

Properties.—The solution is colourless at first, but soon becomes brown from liberation of free iodine. It has a sour taste

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EXPLOSIONS IN THE OPERATING ROOM.

At the last Convention of the American Photographic Association a discussion arose on certain contingent dangers arising in the practice of photography. Every photographer is aware that he is daily employing agents which, if carelessly used, might involve considerable risk. The ether in his collodion is very volatile, and the vapour is very inflammable, so that if a bottle of collodion be broken, and a flame brought near the volume of ether vapour rapidly formed, an explosion is inevitable. The gun-cotton kept by some photographers on the premises is highly inflammable and explosive. Nitric acid, sulphuric acid, and hydrochloric acid are corrosive, and destroy all organic matter with which they come into contact. Almost every chemical the photographer uses is poisonous if taken inwardly, and many of them dangerous to handle unnecessarily or carelessly. But whilst danger may be incurred from carelessness or misuse of the various agents, it is not a danger which is in any sense imminent, or one which need awake apprehension: it should simply form an additional incentive to the precision and care necessary to success in every photographic operation. The dangers discussed at Chicago were of a kind not necessarily arising out of the practice of photography, and need only be incurred voluntarily; and although some uncertainty as to the extent of the risk existed, the cases mentioned were sufficiently numerous to suggest caution.

The dangers to which we refer arise, under certain conditions, in boiling down a silver bath. That explosive compounds of silver are formed by boiling together nitrate of silver and alcohol, and by the combination of oxide of silver and ammonia, is, of course, not to be denied; but there is little risk of the necessary conditions for forming fulminates arising in the boiling down of a nitrate bath, in which the requisite proportion of alcohol or ammonia could scarcely, by any possibility, be present. The danger encountered by some of our American brethren arose from boiling down printing baths to which glycerine had been added. Some time ago the addition of glycerine to the printing bath was recommended as conferring certain advantages, and these baths, when boiled down, had formed, it was alleged, nitro-glycerine, an explosive of a frightfully unmanageable and dangerous kind. Nitro-glycerine is certainly formed when nitric acid and glycerine are heated together, and it is possible that when a nitrate bath containing glycerine is evaporated, the heat carried to the point of fusion of the silver, that some portion of the dangerous compound may be formed: the possibility of risk is, therefore, quite sufficient to be avoided. At the Chicago Convention the sub-

ject was somewhat discursively discussed. Mr. St. Clair earnestly warned the members against the use of glycerine in their baths, and mentioned cases in confirmation of his statement of the risks; whereas Mr. Southworth, a veteran photographer, had seen it in constant use in a gallery where the average number of sitters was seventy daily, without any evil results. Mr. Thomas had, however, lost thirty dollars' worth of nitrate of silver by evaporating a bath containing glycerine. Here is his statement:—"My silver solution not working well, I finally put it on a large fuming dish out at the back door, and set it to evaporating, and kept adding to it. Perhaps I had nearly two gallons of solution, when some one came in and called my attention away from it, so that I did not go out to look at it as soon as I ought to. When I went out I found everything was burning. I turned the light off, took a cloth and set the evaporating dish to one side of the stove I had, and it kept growing worse. Finally, it just burned everything up, and burned my dish up."

Another member, Mr. Uhlman, who heard the glycerine addition recommended at the St. Louis Convention, said: "The same thing happened to me when I came back to St. Louis. I tried it. Whether I fumed it or not, I do not know. Mr. Clemons told us not to do that, but at the point it was about commencing to fuse I had a perfect volcano on my stove, and if I had not had presence of mind enough to take it off quickly, I should have been in a bad fix."

Another member, Mr. Strong, gave similar testimony. He said: "I lost a bath in the same way. Did not think there was any danger in using the glycerine in the bath, and I undertook to evaporate it. I did not burn my fingers; I got out of the way—let it go. I lost the bath. There was no explosion at all; just burned, and went up."

It will be seen that in each instance the solution appears to have been evaporated to dryness, and, at the point of fusion, deflagration ensued. The danger of nitro-glycerine consists in its terribly explosive character under percussion, the smallest particle, when struck by a hammer, producing an explosion frightful in its consequences. The facts stated are sufficient, not simply to suggest caution, but to induce photographers to avoid, at any time, evaporating to dryness a bath containing glycerine.

THE LATE F. W. WINDOW.

We announce, with very deep regret, the death of Mr. F. W. Window, who died, after a protracted illness, on Monday morning last. Mr. Window was a man of high culture and varied accomplishments. By education a gentleman, and profession a civil engineer—a profession to which he devoted many years of his life, both at home and in South America—he finally gave himself up to photography, which he had long practised as an amateur, entering the ranks of professional portraiture, and assuming at once a high position by the excellence of his work. His name has long been familiar to our readers as an able occasional contributor to photographic literature, a series of articles on the mechanical appliances of photography, which appeared in our pages something more than a dozen years ago, abounding with valuable suggestions. Mr. Window has left a definite impression on the progress of the art, although, from his unobtrusive habits, he was not personally familiar to the photographic public. The powder carbon process, especially as adapted to enlargement, which he worked out, the patent of which was acquired by the Autotype Company, with whom he was for some time associated, is a valuable addition to the art, its high capabilities having been admirably illustrated by Mr. Faulkner in his pictures in the recent Exhibition. In his personal character, Mr. Window was a highly cultured gentleman, his bearing being distinguished by a winning courtesy, and modest, gentle dignity.

Critical Notices.

THE NATURE OF LIGHT: WITH A GENERAL ACCOUNT OF PHYSICAL OPTICS. BY EUGENE LOMMEL. (London: Henry S. King and Co.)

PROFESSOR LOMMEL'S volume will be welcome to students as filling a position not exactly occupied by any existing work. Works on optics exist in which the subject is treated in its strictly mathematical and its technical aspects; but we know of no work devoted to the science of light which appears to be at once so popular, and so comprehensively exact. The first part of the title must of course be read with a difference. The nature of light is unknown. Certain laws of light have been carefully ascertained and noted down, and a theory accepted which appears to harmonize with and account for all the known phenomena. And these laws, their history, and operation are set forth by a master who fully comprehends, and is singularly happy in elucidating, his subject. The space at our command forbids us to enter into any critical analysis or description of the work; but we can confidently recommend it to our readers as an admirably complete and attractive exposition of the phenomena and laws of the prime factor in their own art, a book at once fascinating and instructive.

The volume, which is profusely illustrated, is one of the "International Scientific Series" issued by the publishers; and whilst, in some points, it bears the traces of a translator's hand not absolutely at home with the familiar terminology of his subject, it is free from the errors and misconceptions which marked the translation of Dr. Vogel's work in the same series.

A HISTORY AND HAND-BOOK OF PHOTOGRAPHY. From the French of Gaston Tissandier. Edited by J. Thomson, F.R.G.S. (London: Sampson Low, Marston, Low, and Searle.)

A DISINTERESTED observer, examining a record of the literature of photography issued in this country, would be struck with the fact that the principal works at all pretentious or comprehensive in aim have had their origin abroad. America, Prussia, France, and Belgium, have sent us histories and treatises more bulky, more extensive, and more costly, than any written by an English author. In contrast with this circumstance, and possibly in some degree accounting for it, is the fact that England maintains two weekly journals devoted to photography, whilst in no other country is a weekly journal issued, the journals of America and the Continent being generally issued monthly, many of them being avowedly associated with trading firms in photographic materials, to whom such journals afford special facilities for advertising. Cheap manuals of practice England furnishes plentifully, and more comprehensive treatises by American and foreign authors have not been wanting; but we venture to think that the English version of M. Tissandier's work will not be unwelcome. In one important and interesting feature it stands alone: in no work previously issued have we an account anything like so minute, perfect, and interesting, of the origin and early days of photography. The story of Fabricius, the alchemist; and of Tiphaine de la Roche, who spoke of retaining the image reflected from the surface of a fluid by giving a viscous character to the fluid; and the story of Professor Charles and the photographic silhouette; the stories of Davy, of Wedgwood, and of Watt, are charmingly told in the first chapter. In fuller detail we have the history of the experiments of Daguerre, Niepce, Talbot, Herschel, and the other pioneers who gave to the world photography as a practical art. The history and practical details of the varied branches of the art, and of many of its wide-spread applications and developments, are also admirably recorded.

One of the great charms of the work is its charming literary style, which, in the historic portions, is of especial value. Its chief defects are absence of precision, and tendency to generalization in giving technical details. A little more detail and exactness in regard to actual working might give to the work a practical value equal to its historical interest, and in a future edition we shall hope to see improvement in this respect. The work is admirably printed, and got up with the care which distinguishes works from the same publishers; it is profusely illustrated—possibly too profusely, as diagrams of plate-boxes and similar matters cannot be supposed to interest or instruct any of the readers. The frontispiece is a pretty illustration of the work of a new photo collographic process worked out by Mr. B. J. Edwards, and entitled the "photo-tint process." The illustration possesses both force and delicacy. Notwithstanding the minor drawbacks to which we have referred, the book is one we most cordially recommend to our readers.

THE OCTOPUS; OR, THE DEVIL-FISH OF FICTION AND OF FACT.—By HENRY LEE, F.L.S., F.G.S., F.Z.S., &c. (London: Chapman and Hall.)

THE devil-fish of romance, as imagined by Victor Hugo in his "Toilers of the Sea," at once enthralled and repels the reader. The minute and apparently exact array of details at first sight gives the effect of a description by a careful naturalist; and a second reading, whilst it makes evident the vague mysticism of the description, in no wise deprives it of its horror. It seems to surpass the

"Abominable, unutterable, and worse
Than fables yet have feigned, or fear conceived,
Gorgons, and Hydras, and Chimeras dire."

In Mr. Henry Lee's admirable monograph he fairly competes with the great romancist in investing his exhaustive account of this *monstrum horrendum, informe, ingens*, with an interest as absorbing as that of the *pauvre* of Hugo's romance. Mr. Lee is, as most readers of the daily press know, the accomplished naturalist of the Brighton Aquarium, which presents perpetual material for the "Aquarium Notes" of an ardent naturalist wielding a facile pen; and we have here a most complete history of the whole family of octopods—squids, cuttles, and other ramifications of this little known, but extensive, fraternity, the habits and characteristics of the whole class having been the subject of careful observation, whilst the personal history of individuals is made admirably illustrative of all their congeners. This little book shows that the romance of science exactly stated may be as interesting, if not quite as marvellous, as the wildest conceptions of the fabulist.

THE PRACTICAL CARVER AND GILDER'S GUIDE, and Picture-Frame Maker's Companion. (London: Kent and Co.)

HERE is a singularly comprehensive little book. It contains a mass of the most varied information on making, gilding, and re-gilding frames; describes various mouldings and their manufacture; gives valuable hints for cleaning and restoring engravings and paintings; making mounts and mounting pictures; varnishing, French polishing, and an infinity of things of a similar kind. The author simply describes himself as a "Practical Hand;" and, from the essential, simple, straightforward character of the instructions, there can be little doubt that he is what he describes himself. This book ought to be in every photographic studio. We shall recur to it again when space permits.

THE SCIOPTICON MANUAL. (Cliff House, Green Hythe.)

THIS is a third and improved edition of Mr. Woodbury's Sciopticon Manual, describing this improved form of lantern, and affording full instructions for using it to secure a variety of desirable effects.

THE AUTOTYPE PROCESS: Being a Practical Manual of Instructions in the Art of Printing in Carbon or other Permanent Pigment; with a Notice of the Autotype Photo-Mechanical Printing Process. Fourth Edition, Revised and Enlarged. (London: Spencer, Sawyer, Bird, & Co.)

It is unnecessary to do more than announce that this new edition of the Manual of Carbon Printing is now ready, and contains complete instructions for working all the operations to which carbon printing is applicable. A capital photo-collagraph of the Company's work serves as a frontispiece.

YORK'S LANTERN READINGS. By Various Authors. (London: F. York.)

LANTERN READINGS, ORIGINAL AND SELECTED. Vols. I. and II. (Birmingham: Alfred Pumphrey.)

THE value of brief, clear, descriptive and historical readings or lectures, for delivery in connection with various series of lantern exhibitions, needs no affirming. In Mr. York's series we have lectures by various known authors; a Walk in the Zoo, for instance, is conducted by Mr. H. Gore, C.E., who also accompanies them from London to the Falls of Niagara; in a trip through the Arctic Regions the audience is accompanied by Commander Cheyne, R.N.; Col. Dixon acts as cicerone through Mysore; whilst Mrs. Noel Thatcher relates the history of Sir John the Giant Slayer, an allegorical temperance tale. There are some other temperance teachings illustrated by the lantern, and some very useful details to accompany the admirable series of London views which Mr. York prepares for the lantern.

In Mr. Pumphrey's series of readings, original and selected, we have two volumes of similar valuable adjuncts to the interest and value of lantern exhibitions extending over a very wide range of subjects; brief, pithy, and interesting. All interested in evenings with the lantern should make themselves acquainted with the whole of these lantern readings without delay.

JACK IN THE BOX. The Christmas Number of "Once-a-Week." By G. MANVILLE FENN. (London: 19, Tavistock Street, W.C.)

THE practice, which for years past has grown into a pleasant custom, of issuing a special number of a serial publication especially fitted to interest, enthrall, or horrify, its readers in the Christmas season of holiday rest and holiday enjoyment, has acquired a high success in connection with "Once-a-Week." Mr. Manville Fenn has long been recognized as one of our most successful tale writers—especially the class of tale which incidentally points a moral, or exposes a social blot, without in the slightest degree obtruding a purpose. This year's annual is a tale of railway life told in twenty-five signals. The graphic style, the perfect maintenance of a growing interest in a thrilling story, are admirably perfect. We commend it to all our readers. It is not a photographic subject, but it is human, and even photographers are men!

PHOTO-LITHOGRAPHY IN NEW ZEALAND.

THE value of photo-lithography as an accurate, rapid, and economical method of multiplying maps, plans, and other official documents and designs, is rapidly gaining the attention of government departments in all parts of the world. We have before us a report by Mr. Herbert Deveril, of the results of its application in the Government Establishment, Wellington, New Zealand. In 1872 it was decided that in future the plans of patents, &c., should be reproduced by photo-lithography, and Mr. Deveril was entrusted with the charge of the department in the spring of 1873, and in the course of the next twelve months, nearly seven hundred sheets or sections had been reproduced, some of them as large as four feet by three

feet. As the result is successful and satisfactory, the resumé of the operations given in the report may be found instructive. Mr. Deveril first gives a brief description of the purpose and principles of the process, and then gives the mode of working adopted.

The object of photo-lithography is, he says, to reproduce in fac-simile, or on a reduced scale, maps, plans, manuscript, &c.; and before proceeding to describe the manner in which photography is used in the process, it would be as well, perhaps, to first refer to the method of ordinary lithographic printing from transfers.

Lithographic stones are limestone of a porous nature, and readily absorb water. They are cut to a suitable size, about two or three inches thick, and are ground flat, polished with pumice and snake-stone, and, being thoroughly dried at the fire, are laid upon the bed of the lithographic press ready for the transfer. As an instance of the method of producing copies of the transfers, we will take an ordinary departmental circular. This is written upon transfer paper with transfer ink. The transfer paper is paper coated with a certain composition in which isinglass figures as the chief item. The peculiarity of the ink consists in the fact of its containing grease.

Now the stone being ready, as stated above, the back of the transfer is damped with a wet sponge; the damp being readily absorbed by the isinglass renders the face tacky, and in this condition the transfer is laid face downward on the stone, backed with a few sheets of paper, and passed several times through the lithographic press. The immediate result of this is that the stone, from its peculiar nature, retains the grease from the ink with which the transfer is written. Water is next poured on the stone, which absorbs it freely, except in those parts or spots holding the grease from the transfer ink. The process of printing may now be easily understood, at least its theory, by considering the natural antipathy to each other existing between water and grease. A roller charged with ink containing grease is rolled over the wet stone, the ink taking readily to those portions which have previously received the greasy ink from the transfer, but being repelled by the water in the other portions of the stone. Sufficient ink being rolled on, a sheet of paper is placed over it and the proof pulled.

Photo-lithographic transfers are treated in precisely the same manner, being, in effect, photographs in greasy ink upon a substance that will stick sufficiently to the stone in transferring.

THE PRODUCTION OF THE PHOTOGRAPHIC NEGATIVE.

The map or plan to be reproduced is pinned on the wall at one end of the operating room, and the camera, which, mounted on a heavy stand runs on a tramway carefully adjusted at right angles to the plane of the wall, is brought to its position, and focussed according to the size of the reproduction required. The lens generally used is Dallmeyer's rapid rectilinear, but for certain classes of work his triplet is substituted. The glasses mostly used are 16in. square patent plate.

The ordinary process of photography as practised now for portraits, views, &c., with the bromo-iodide of silver, is unsuitable for the production of negatives for photo-lithography, which should be absolutely clear and free from fog in the shadows or lines, and as intense and non-actinic in the lights as possible. Operators work differently to secure this desideratum. The following is the method practised in this office:—

The collodion is made as follows, and is never used until at least a week after iodizing:

Rectified sulphuric ether (s.g. 720) ...	6 pints
Alcohol (s.g. 806) ...	3 "
Pyroxyline*	1450 grains

* Made according to Hardwick's formula. Sulphuric acid, s.g. 1.845, 2 fluid ounces; nitric acid, s.g. 1.42, 1 fluid ounce; water, 2 fluid ounces; cotton, 50 grains. Temperature, 170deg. Fahr. Time of immersion, five minutes.

Iodized with the following :—

Alcohol	(s.g. 815) ...	3 pints
Iodide of potassium ... ..	...	840 grains
Iodide of ammonium ... ..	...	150 "
Iodide of cadmium ... ..	...	90 "

The nitrate bath is prepared with

Distilled water ... ..	...	13 pints
Nitrate of silver ... ..	...	20 ounces

To this is added, before filtering, a few drops of iodizing solution.

After exposure in the camera the plate is developed with

Water ... ..	...	80 ounces
Proto-sulphate of iron ... ..	...	3 "
Glacial acetic acid ... ..	...	2½ "
Spirits of wine ... ..	...	Quant. suff.

The development must not be prolonged, nor must it be forced on under-exposed plates. A rather stronger solution of cyanide of potassium than is generally used is employed to dissolve the unaltered iodide of silver, and the plate should now show as a fully exposed positive with perfectly clear shadows. A few drops of a strong aqueous solution of iodine in iodide of potassium is next diluted with water to the colour of brown sherry, and the plate flooded with it in presence of white light, after which is applied a dose of ordinary re-developing solution composed of pyrogallic and citric acids with a little dripping silver. This stage requires especial care that the intensifying be not carried too far, for if the silver be piled on to any great extent it will overlap and injure the sharpness of the fine lines, or may destroy them altogether. The negative is now, after careful washing, plunged into a saturated solution of bichloride of mercury, the first effect of which is to turn the film black, but after a short time it becomes quite white. It is immaterial what time the plate remains in the bath of corrosive sublimate, provided it is long enough to convert the whole of the metallic silver into the white salt of mercury and silver. When taken out it is well washed, and a weak solution of iodide of potassium in water poured on and off until the film is yellow right through to the glass.*

As a rule, the negative is now flooded with a solution of gum-arabic, and stood on a rack to dry; but if considered advisable, a weak solution of chloride of gold is poured over, which increases the density. If there appears a tendency on the part of any of the fine lines to fill up, or fog, a weak solution of cyanide may be poured on and off after the treatment with the iodide of potassium. It is found in practice that the gum-arabic affords sufficient protection in printing, and enables the glasses to be used over and over again without the difficulties in cleaning which would occur were the negative varnished.

THE PRODUCTION OF THE PHOTOGRAPHIC TRANSFER.

Various ways are practised to obtain from the negative, produced as above, a positive in reverse upon the lithographic stone; but one of two methods is mostly used, the chemical theory of both being alike, while in their mechanical effect they are quite different. In one the white parts of the subject are transferred to the stone, leaving the lines open to absorb the greasy ink poured on them; in the other and more frequently used method the lines in greasy ink are transferred to stone. The latter is the method practised in this office, and the theory of its working may be easily understood.

Gelatine and many other organic substances readily soluble in water, if mixed when in solution with bichromate of potassium, acquire the property, when dry, of becoming insoluble after exposure for a short time to white light.†

If paper coated with gelatine and bichromate of potassium, and dried, is placed in contact with a negative and exposed to the sun's rays, the action of the light through the transparent portions of the negative, which represent the lines of the subject, renders those parts insoluble; whereas the remainder, which has been protected from the light by the opaque portions of the negative, is in no way altered. If now the whole surface of the print be coated with transfer ink, and afterwards the print itself placed in warm water, the gelatine in the parts unaffected by light readily dissolves, and carry with them the ink, leaving the lines only upon the clear paper. This method is that practised at the Ordnance Survey Office at Southampton, but is not adopted by me for two reasons: first, that from the fact of there being no gelatine left on the paper, except that covered by ink, it is impossible, in transferring, to pass the stone more than once through the press, for fear of the transfer shifting and the lines doubling; and secondly, in washing away the unaltered gelatine, that which is left on the lines is apt to be ragged and broken.

Osbourne's process, as practised in Melbourne, obviates these difficulties in an ingenious manner. There the gelatine is mixed with albumen, and after the print is coated with transfer ink, it is floated for a few minutes on boiling water, which coagulates the albumen, and holds it and the gelatine, or the greater portion of it, fast to the paper, the ink washing away with the aid of a sponge. This method was practised here at the commencement of work, but is now discarded. It was found that the ink, softened by the action of the boiling water, gathered to a considerable extent upon the lines, rendering them liable to "smash" in transferring, especially when used fresh; and also that soluble gelatine was present in the transfers, and required more boiling water to dissolve and clear it away than could be conveniently used, considering the amount of work to be performed. After a number of experiments I succeeded in working out a modification of the process, which works satisfactorily, and the following is the method in detail :—

Gelatine is soaked, and afterwards dissolved in water over a gas stove, and heated to a temperature of 110°, Fahr., when a solution of chrome alum† is added, well stirred, and the whole strained. Paper is coated with this, at a temperature of about 90°, and is hung up to dry, when it becomes insoluble, although still capable of absorbing water. This operation is conducted in daylight, and any quantity of paper may be prepared at a time, as it appears to keep for any length of time. Paper prepared thus has been sent by me to England, and there yielded excellent transfers. It is sensitized by floating for a few minutes on a saturated solution of bichromate of potash, and hung up to dry in a dark room. When dry, I claim that this sensitized paper will keep for a greater length of time without deterioration than that prepared by any other process with which I am acquainted. Tannin may be used in lieu of chrome alum, but the paper, when the latter is employed, seems to keep longer after sensitizing. A sun print is taken on this paper in the ordinary manner from the negative, and is afterward laid face downwards on a lithographic stone coated with greasy transfer ink, and passed through the press. The surface becomes by this treatment coated with a thin coating of ink. It is next floated for a minute or two, face upwards, on a dish of cold water, and then laid upon a sheet of zinc. The water having been absorbed, through the back of the paper, by those portions of the gelatine not acted upon by light, the ink is readily removed with a wet sponge and a little friction. A few minutes' soaking in a dish of clean cold water removes

but if organic substances are also present, the chromic acid is reduced to the condition of a lower oxide of chromium, and the liberated oxygen unites with the organic body. Some kinds of organic matter act more decidedly than others, and especially gelatine, which reduces the bichromate rapidly in presence of sunlight, the gelatine itself being oxidized into a resinous substance which remains in union with oxide of chromium.—*Herdwick A.*

† The proportion varies according to the quality of the gelatine, and I have found different samples of chrome alum affect the gelatine differently.

* Instead of the iodide of potassium, a weak solution of hydrosulphate of ammonia may be used, which converts the deposits into sulphide of silver; but the continual stench of sulphuretted hydrogen in the place is trying to health and temper, and is therefore discarded in favour of the less offensive iodide of potassium.

† Bichromate of potash contains chromic acid, which is a high oxide of the metal chromium. Light alone produces no effect upon chromic acid,

the now useless bichromate, and the transfer, being of a clear white, enables any remaining ink to be seen and easily removed. It is now hung up to dry, and is ready for the stone.

It will be seen that the white portions of the transfer, being still covered with the original coating of insoluble gelatine, are yet capable of absorbing a sufficient quantity of water to render them "tacky," when wetted at the back or placed for a few minutes between sheets of damp blotting paper, to adhere firmly to the stone in transferring, and this is of great advantage to the printer, as he is not required to deviate from his ordinary method of working: nor is there the slightest difficulty in detaching the paper when the transfer process is complete. The lines of the transfer are less liable to be ragged and broken than if the gelatine were removed from the paper; and further, the discarding of boiling or even hot water (on account of the gelatine being in the first place rendered insoluble), necessary for the removal of ink or soluble gelatine, does away with the attendant atmosphere of steam and heat from the fires. Finally, the ink, not being softened by boiling water, is retained on the lines of the transfer only, according to the amount originally put on, and does not gather and afterwards smash, and distribute or thicken on the stone.

In case of any accident to the stone, or should a fresh transfer of a subject which has been once put down be needed, the once-used transfer can be again inked and washed off, and is then ready to be transferred again.

In cases where copies of subjects are likely to be wanted at some future day, two or more prints are taken, and the bichromate at once washed out, when they are hung up to dry and laid aside. These can at any time be inked, and rubbed off, and the resulting transfer be ready in a few minutes.

RETOUCHING NEGATIVES BY MEANS OF COLOURED COLLODION.

(FROM "RETOUCHE PHOTOGRAPHIQUE.")

M. FRITZ LUCKHARDT, the Vienna photographer, has invented a method of retouching which gives the most excellent results. Everybody knows that the artistic effect of a portrait depends principally upon the harmony of contrasts which should exist in the different parts of the positive print. To obtain this result, you generally print the cliché in the manner following:—

As soon as the positive print appears, you paste some small pieces of black paper, cut to proper shape, upon the exterior of the printing frame in places corresponding to the head, hands, &c., so that you can allow other portions and further details to print out more thoroughly. When this operation is finished, the positive print is placed under a very clean glass plate, the portions of the negative sufficiently printed are masked with cotton-wool, and the light is allowed to act further upon any other parts if necessary.

This method, we believe, resembles the one adopted by M. Adam Salomon in the printing of his admirable pictures. But the cutting out of paper masks and successive printings of the negatives occupy a good deal of time, and, moreover, the manipulations involved are of a delicate nature, and for these reasons M. Fritz Luckhardt recommends the plan I am about to describe, in particular where it is a question of over-printing certain parts of the negative, such as portions of lace, white robes, &c., so as to bring out the details without the hands, face, or other portions of the model being rendered too dark.

An alcoholic solution of aniline red is prepared (fuchsine) of a very dark character, and of this is poured a few drops into some normal collodion which has been cleared well by standing. In this way a liquid is secured more or less deeply tinted, and, if desired, several such liquids may be obtained, varying in tint, ready for use, under different conditions.

If a case arise in which it is desired that portions of a negative should be rendered more intense locally (the face, hands, or any other parts), collodion of a sufficiently red tint is chosen, and a small portion applied to the back of the plate. In this way a more or less transparent and very uniform film is produced, which is permitted to dry as much as necessary. In this condition the negative is brought to the retouching desk, and the outlines which it is desired to protect with the coloured collodion are traced over with a needle, placed, for convenience sake, in a wooden handle.

This done, by means of a piece of wood tapered in a suitable manner, the superfluous coloured collodion is gently removed from those parts which are not required to be covered up, and, to facilitate the operation, the wooden tool is moistened with a little water.

To render the picture more dark, the face, hands, and garments are left covered; if, on the contrary, the background, the hair, &c., are required clearer, then the contrary is done.

At the expiration of a few hours, the collodionized parts become very hard, so that there is no need to fear that they will be injured by contact in the printing frame. At the same time, if one desires to be assured that the tinted collodion is firmly fixed to the back of the negative, a coating of negative varnish may be applied, although this operation is not always to be recommended, as the removal of any or the whole of the tinted collodion subsequently is thereby rendered extremely difficult. Only, therefore, in extreme cases is the application of varnish to the tinted film to be advised.

It is necessary in this retouching method to trace the outlines very carefully by the aid of the needle instrument we have mentioned; the masking being at the back, the thickness of glass which intervenes between the image and the coloured screen permits the production of double outlines in the print, and softens down the sharp markings made by the needle.

The photographer will understand at once that with the aid of collodion tinted much or little in the manner described, he can modify in any way he pleases the printing qualities of a cliché, and it is done, too, in the simplest and most rapid manner. Work executed by a brush or pencil would be far more tedious and time-taking, and it would also interfere to a greater extent with the original characteristics of the negative.

Not only is this method of M. Fritz Luckhardt available for treating portrait and group negatives, but it may also be employed, and with the same excellent results, to landscape pictures of all kinds, as also in reproductions of paintings, where certain colours in the originals either do not come out so forcibly in the copies, or are far too glaring. In such instances as these the partial covering up of the negatives with tinted collodion is obvious, in order to produce more perfect prints. The intelligent artist will, in fact, at once see the great aid he may derive from the method, as the tinted collodion acts mechanically upon the plate pretty well in the same way as an intensifier does chemically upon the silver film.

METEOROLOGICAL REPORT SHOWING THE DIURNAL VARIATIONS IN THE CHEMICAL POWER OF THE SOUTHERN SKY.

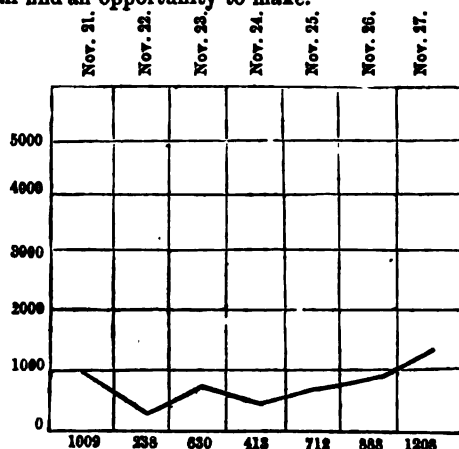
FROM OBSERVATIONS MADE AT BLACKPOOL, IN LANCASHIRE.

BY D. WINSTANLEY, F.R.A.S.

THE daily average of light again has risen, having during the past week been as 728 chemical units to 662 for the week preceding.

I shall, in all probability, issue shortly lithographed diagrams showing the hourly variations in the aggregate of light. In doing this, however, it does not seem to me that the form of diagram I now adopt will exhibit in its truest form the hourly variations in the obscuration of the atmosphere, which, after all, are in effect the objects of my

measurements. Were the sky, for instance, during one whole day absolutely unobscured, the light would wax from the rising of the sun until its meridian passage, and wane again until its setting, thus exhibiting a variation of effect in no way resulting from cloudy obscurations, which latter would be correctly indicated only on diagrams whose parallels are curved, and with their convex sides downward. The nature of the curves might be deduced by calculation, though I should prefer to get at it by actual observations beneath a cloudless sky, and these, I dare say, I shall find an opportunity to make.



NEW METHOD OF ESTIMATING SILVER IN PHOTOGRAPHIC SOLUTIONS.

In *Dingler's Polytechnisches Journal*, M. J. Volkard suggests a method of determining the quantity of silver in solutions, the principle on which it is based being that soluble cyanide compounds form a curdy precipitate of cyanide of silver when mixed with acid silver solutions. The same kind of precipitate of cyanide of silver is also given on mixing silver solutions with the blood-red solution of sulphocyanide of iron, the colour of the latter instantly disappearing. If, therefore, a solution of cyanide of potassium, or cyanide of ammonium, is mixed with an acid silver solution to which a little sulphate of iron has been added, every drop of the cyanogen solution brings about a blood-red cloud, which disappears, however, on the solution being stirred, the latter becoming white as milk. Only when all the silver has been precipitated as cyanide of silver does the colour of the sulphocyanide of iron remain.

If it is known how much of the cyanogen salts is necessary to precipitate a particular amount of silver, it is, obviously, possible by this means to ascertain quantitatively the amount of silver in every solution of that metal. The method, too, is capable of employment under the most general circumstances, for it permits of quickly and surely determining such bodies as may be precipitated from acid silver solutions—such as chlorine, bromine, and iodine—by precipitating them with silver solutions of known strength, and titrating back the superfluous silver added with a solution of cyanide. Especially in the case of the above elements being in organic combination, the new method of Volkard will be especially applicable.

Far superior, too, to the chromate of potash method of Mohr must this one of Volkard be considered, for it possesses the following particular advantages:—

1. It is carried out with an acid solution, while the Mohr method necessitates a neutral liquid, which renders its use very limited.
2. The combination with its indicating colour is soluble, and the reaction is therefore easily recognised.
3. The sulphate of iron solution employed is itself colourless, and may, therefore, be added in larger quantities.

The fluid titrated by Volkard is cyanide of ammonium. As this salt is too hygroscopic to permit of its being weighed, the solution is used with a silver solution; this is produced by dissolving 10 grammes of pure silver in sulphuric acid, and diluting the liquid to 10,000 cubic centimetres. A larger quantity of cyanide of ammonium is dissolved in water, so that about 8 grammes are contained in 1 litre of solution.

Ten cubic centimetres of the silver solution are put into a beaker, together with 5 c. c. of a pure solution of sulphate of iron (containing 50 grammes of oxide of iron per litre), and 150 to 200 c. c. of water. The cyanide solution, constantly shaken, is now gently added or titrated until the liquid has assumed a slight reddish tone. Since there has been used for every 10 c. c. of silver solution 9.6 c. c. of cyanide solution, 960 c. c. of the latter is diluted to 1000 c. c. One c. c. has then for every 10.198 milligrammes. Before use, this solution is tested once more. To this end, 1 gramme of pure silver is weighed, and this is dissolved in 8 to 10 c. c. of sulphuric acid, and the solution then evaporated in a sand-bath until not a trace more of acid is given off; and subsequently 5 c. c. of iron solution is added, and diluted with 200 c. c. of water. When cold, the cyanide solution is gradually added, and with the last drop of the hundred cubic centimetres, the reddish tint should permanently set in.

Correspondence.

URANIUM IN THE NITRATE BATH.

DEAR SIR,—Seeing a remark in last week's *News*, I write to say that my negatives of this summer's work were some wet, and some dry. Both ways of working have given me satisfactory results.—I remain, yours truly,

H. STUART WORTLEY.

WASHING PRINTS.

DEAR SIR,—In your issue of September 10th, a correspondent recommends a tin box, with a series of false bottoms, having partitions in them, for different sized prints for washing. Fifteen years ago, when the quarter, one-third, one-half, and whole sizes were in demand, I had a number of trays, made of perforated zinc, with partitions for different sized pictures. Six or eight of these trays filled with prints were tied together, and suspended in a cistern with constant running water, and kept turning during the night through being attached to a meat jack—one made with a stronger spring than requisite for turning a joint. I do not believe in long washing myself, but the use of the meat jack might be adopted by some who do.—I remain, sir, yours truly,

C. T. NEWCOMBE.

Talk in the Studio.

IMPROVED EXTENDING TRIPOD LEGS.—Mr. Kennett has just favoured us with a sight of a set of tripod legs with an improvement of a singularly ingenious and simple character. The normal height of the legs is about three feet, extending to nearly double that height. The great improvement consists in the absence of screws, either fixed or loose, for clamping the extending portion of the leg in any position required. This is effected by an oval sliding ring, which holds the outer portions of the leg and the sliding centre portion with a firm grip. It is difficult in a few words to explain how this ring, sliding on the inclined plane formed by the legs, grips firmly; but it does so. It is exceedingly light, rigid, and efficient, and free from the projection of fixed screws, or the risk of loss of loose screws.

CAUTION AS TO SALE OF METHYLATED SPIRITS.—Recently, at Wandsworth Police Court, Mr. W. H. Kempster, a surgeon of Battersea, was summoned by the Excise authorities for selling methylated spirit without a licence. The defendant said he was not in the habit of selling the spirit. It was a case of A inducing B to commit a crime, and C being called upon to answer it. He called Charles Spencer Aitken, his

dispenser, who said the officer asked him if he sold methylated spirit. He said "No." The officer pressed him to sell him some, and said if the doctor was there he would let him have it. He then told him he would oblige him with some lamp spirit, and he sold it to him. He never sold any there before. Mr. Ingham thought that the evidence exonerated the defendant, and dismissed the summons.—Another surgeon of Battersea was also summoned for a similar offence. This defendant also denied being in the habit of selling the spirit, and complained of the persecution to which he had been exposed. He said he told the officer he was not sure whether a licence was necessary, and that if he was an Exciseman he had better go away without it. It would have been more manly, he contended, if the officer had cautioned him instead of taking the spirit. Mr. Ingham imposed a penalty of £12 10s., and suggested that the Board of Inland Revenue, under the circumstances, should reduce it to the nominal sum of £1.—Other persons were summoned, and the mitigated penalty of £12 10s. was imposed in each case.

HALF-SILVERING.—M. Leon Foucault has devised a method to which the name of half-silvering is given, which has been applied to glasses for solar observation. The exterior face of a glass thus prepared reflects the greater portion of the calorific rays without impeding the passage of the luminous rays, thus rendering the intervention of coloured glasses unnecessary. The process consists in stopping the operation as soon as the silver begins to show upon the glass. The latter is removed, washed in distilled water, and dried. It must not be rubbed afterwards. Experience will show the right moment to remove the glass so as to obtain the amount of silvering requisite for the exclusion of a definite amount of light.—*Les Mondes*.

To Correspondents.

D. V. M.—Very many thanks. As soon as possible; but within a week will do.

W. W.—All the formulae for the use of washing soda in the toning bath are necessarily indefinite, because, in using soda, observation rather than precise figures must be depended on. The action of the soda salt is, first to neutralize any free acid in the chloride of gold, and next to aid in decomposing the chloride of gold. A very small proportion will do this slowly, and a large proportion will do it rapidly. One grain or less of the soda salt to each grain of chloride of gold will do this effectually, and the bath would be ready for use probably in half an hour after mixing, and continue good for an hour or two, or even more; whilst if ten or twenty grains of soda be used, the same end only will be secured, but much more rapidly. Probably the bath would be ready for use in a quarter of an hour, and past use in an hour or a little more. The great disadvantage of the gold bath with carbonate of soda are first uncertainty, and second instability. No law can be laid down precisely as to how soon it should be used after mixing; it can only be learned by observation and experience. If used too soon, the print is bleached and mealy; if too late, it is inactive, and never keeps in working order more than a few hours. If you neutralize with chalk there is no need to add soda. If you use soda there is no need to neutralize with chalk. They both perform the same office, chalk having the advantage that, being insoluble, you cannot use excess. If you wish to use soda, try one or two grains to each grain of chloride of gold.

J. NELSON.—We regret that the space available in this column for answers to correspondents is insufficient to permit us to repeat the whole instructions for enamelling prints here; but you will find all you require in our YEAR-BOOK, which will be ready this month. We may here briefly indicate the mode of proceeding. A piece of clean plate-glass is coated with a tough plain collodion, and allowed to dry. This is then coated with a warm solution of gelatine, which is allowed to set. A print is then immersed in water, and laid face down on the gelatine, and rubbed down with a squeegee, then placed under a weight to dry, when it will leave the glass of its own accord, presenting an enamelled surface. We are glad to learn that you have found the NEWS so useful to you.

NAILOR.—The Autotype Manual is now ready. Study it carefully, and then submit to us any special difficulties you find, should you not succeed. Your letter is still insufficiently clear as to the precise operations you adopt, and the special points where difficulty arises.

EDWIN LEE.—We have not as yet received any information as to when and how English contributions of photographs are to be sent to Philadelphia. We shall, doubtless, shortly receive official instructions, which we shall publish at once.

J. T. ANDERSON.—Our own experience with carbonate of soda (*salt soda* in American formulae) in the toning bath is decidedly unfavourable; but we cannot understand your failing to get any result on using the bath in question as soon as it was made. We should expect, if used at once, it would tone, but would bleach and give mealy prints, and that in a few hours it would cease to tone at all; but we have not tried it. But you must bear in mind that all American printing formulae are almost based on the idea of the paper being fumed, which makes a great difference in the result.

W. STREPHENS.—The use of photographs of natural flowers for producing borders, backgrounds, or other decorations on portraits, is not new, and could not be, in any case, protected by registration. Such effects are, nevertheless, when well managed, very pretty.

W. EWING.—If you send to Messrs Marion and Co., Soho Square, or to the Stereoscopic Company, 54, Cheapside, enclosing stamps, they will, doubtless, forward you an example of the "Rembrandt" style of portraiture.

M. L.—There are several formulae for preparing mat varnish; but we do not know any better than that of Mr. Alfred Hughes, first published in our pages. It consists of gum sandarac half an ounce, Canada balsam one drachm, sulphuric ether seven ounces; to this solution three ounces of benzole are added. The varnish is applied cold; but heat may afterwards be employed to harden the surface.

FOGARO.—It is not always easy to make albumenized prints perfectly transparent. In many cases it is necessary to soak them in warm water to which a little soda has been added to remove the size from the paper; dry; then wax them in the usual manner employed in waxing calotype negatives, which means: saturate them with wax, and then iron between blotting-paper with a warm iron, to remove excess of wax. Almond oil and castor oil are very efficient in producing transparency, but the print is apt to remain slightly greasy. It is not necessary to mount the prints on glass in order to print from them; but if you so mount them, it must be with a thick varnish. 2. You cannot certainly know whether an engraving is copyright without much enquiry and study. Copyright in engravings is protected by three Acts, with the provisions of all of which you must be familiar; and then you must ascertain, in relation to every engraving about the protection of which you wish to know, how far all the provisions of these Acts have been carried out. This is the only mode in which you can ascertain with certainty whether an engraving is copyright or not. One of the most obvious indications of copyright is the presence of what is termed the "publication line"—that is, an announcement of the date of publication, and name and residence of the owner of the copyright. The absence of the line is regarded by some as evidence of the non-compliance with the Copyright Act; but the line may have been on the print when issued, and cut off afterwards. As a rule, unless you are absolutely certain there is no copyright, it is safe and wise to assume that a property in a design belongs to some one. If you meet a valuable dog in the street, you assume it is some one's property, although no name nor address appear on the dog's collar.

W. G.—The retouching is very well and carefully done. There is a tendency to just a little excess, the lines and shadows in the orbit of the right eye being almost removed by the softening process.

THOS. SIMS.—Thanks. We will see that the technical distinction between mezzotint and aquatint is made clear.

G. CROUGHTON.—Many thanks. The prints of the schooner, taken under the circumstances described, are very interesting.

R. F. D.—Imperfect fixation is the cause; and the prints furnish a very bad example of this defect. You must have been using an old exhausted hypo bath, which had been used many times before. However small the number of prints you may fix at any one time, always throw the hypo away at once; never use it a second time if you wish to have any chance of permanent prints. 2. You can purchase tinted albumenized paper, or you can use Judeon's dyes.

J. H. L.—The apparatus exhibited at the South London Technical meeting was, we understand, made by Mr. Trench, of Fleet Street.

CUCULOS.—You will see that we cannot possibly repeat formulae and details of complete processes in this column, for lack of space. We have several times given full instructions for printing on silk and fabrics, both in the NEWS and YEAR-BOOK. In several back YEAR-BOOKS you will find hints. In that of 1867 we remember. In general terms, dilute an ounce of albumen with from twelve to twenty of water, salts to about five grains per ounce, immerse the silk; dry; excise on a fifty-grain bath. Dry, print, tone, fix, wash, and iron. 2. You can obtain soda water glass of most chemists. 3. Please repeat your question more fully; we do not know what you wish to know about the varnish. You say "tell me about" such and such a varnish. Tell you what? And always please refer definitely to the subject, and where it is described in the NEWS, as that saves us much trouble.

Captain Turton, S. Botton, J. C. Stanning, A. Ford Smith, T. Brownrigg, A. C. Burgess, T. Tedrake, W. Neilson, G. Bruce, R. T. Williams, F. Hudson, N. K. Cherrill, C. B. P. Vernon, C. J. Eve, and others.—Many thanks.

Several Correspondents in our next.

The Photographic News, December 10, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

ABOUT ENLARGEMENTS—MR. CROOKES' RADIATION EXPERIMENTS—CHRISTMAS CARDS.

About enlargements.—Those who do not make enlarging their special study find that success in this branch of photography is by no means easily attained. The best enlarging apparatus—or, at any rate, that which gives the best results under ordinary circumstances—is, in all probability, the copying camera, which bears the transparency at one end, and the lens behind it. With a large camera of this kind, which need not be such a very expensive structure, good enlargements may be produced after very little experience, and that is more than can be said of other methods of enlargements. We have tried converting the dark room into a camera with some success; but it is better to have a camera specially adapted to one's wants. One important aid, we may mention, in this mode of enlarging is, a sheet of ground glass. The great thing to be attended to, after a clear, thin transparency has been obtained, is to light it up thoroughly well; and if you have a heliostat at your disposal, such as may be found in one or two studios we know of, there will be no difficulty in securing a full flood of light upon the image during the exposure. The next best thing is a hand mirror, to concentrate the rays upon the transparency; but in both cases something more is wanted to make the thing perfect. Let any one stand looking at the image on the focussing glass, and observe the difference in the degree of brightness when the mirror is and is not employed, and he will be at once convinced of its usefulness. He may then go a step farther. Having adjusted the mirror, let him again watch the image, and get an assistant to interpose between the transparency and the mirror a sheet of ground glass. This diffuses the light, as he may have guessed; but it does much more besides—it increases the brightness of the image again wonderfully, so that the exposure can be reduced by fully one-third. It may be a little difficult to explain why this should be, but that it is so is patent to any one who has tried the experiment. It is not, however, so much upon the question of manipulation, and the art of producing clear, vigorous enlargements, that we desire to speak just now, so much as about the truth of the amplified pictures. It is very difficult to enlarge a landscape of small size, for instance, so that it appears true to nature. We have seen enlargements from negatives of our own which we could scarcely recognise as pictures of the spot where they were taken; and not only this, but they perverted the truth in a manner that was quite incredible. The pictures to which we allude were taken, in the first instance, with a small wide-angle lens, and then copied by an ordinary portrait instrument, the result being a very unsatisfactory one. In one photograph two figures were shown upon a glacier; in reality, these persons were upon plains of ice extending for miles in front, while the nearest wall of rock was certainly half a mile distant. This may be gathered, to a certain extent, from the original picture taken with the wide-angle lens, only the latter has already depressed the tall mountain in front to half its height, and exaggerated the foreground so much that a hundred yards of ice seem to lie between the point of view and the figures, which were really but a dozen yards off at the most. In the enlargement everything is changed; the snow mountain in front looks the shape of Primrose Hill, and appears to be about the same height, while the mountaineers seem to be actually rubbing against the dark rocks on their right, which in nature were so far distant. Such a production at once shows how very necessary it is to choose suitable lenses for copying and enlarging purposes. As a rule, we hold it best always to

employ the same lens for enlarging that was used for taking the picture in the first instance; but a better course than this is the one a German physicist, Professor Zeugner, of Prague, lately pointed out in these columns. He showed very clearly why enlargements are generally so coarse and exaggerated, and why no amount of care in focussing, or skill in manipulating the negative, will furnish sharp clear pictures. His explanation was that lenses were either under or over corrected; or, in other words, when you photograph three points, 1, 2, 3—No. 1 being nearest to the camera, and No. 3 farthest—and focus sharply on No. 2, some lenses will render No. 1 sharper than No. 3, while others again will render No. 3 sharper than No. 1, which is thrown considerably out of focus. Herr Zeugner argues, with very good reason, that if you want to enlarge accurately, you must employ two lenses, one being used to compensate for the faults of the other. You take the first image with a lens that has the defect of being under-corrected, and then proceed to make a second enlargement with one that is over-corrected. In this way only can an enlargement approaching to truth be secured. Unfortunately, photographers have not generally a very wide choice of lenses; but it would be well, nevertheless, for them to ascertain whether the instruments they possess are under or over-corrected. This is easily done, as we have shown, by placing three points at different distances from the camera, focussing on the middle one, and then observing whether it is the nearer or farther point which is the more sharply rendered. No doubt an optician, in selling a lens, would be quite as ready to furnish an over as an under corrected lens at the option of his customer. In the meantime, photographers should understand that this lack of sharpness, and exaggeration upon exaggeration, which is so often seen in enlargements, is frequently inherent to lenses employed, and for this reason it is that very much depends in enlarging upon the kind of instrument you use.

Mr. Crookes' radiation experiments.—We are glad to hear that a royal gold medal has been bestowed upon Mr. William Crookes, F.R.S., by the Royal Society this year, for various discoveries and researches, and especially for his recent study of light. His discovery of repulsion referable to radiation, which we mentioned some time back in these columns, seems to have called the particular attention of the Council of the Royal Society to Mr. Crookes' claims as an original investigator, and to have decided them to offer him the honour in question. Our readers will remember that Mr. Crookes has broken perfectly new ground in his last physical investigations, which may lead to the development of our knowledge of light in a very considerable degree. He has shown us that radiation has a mechanical property, and that it is capable of setting objects in motion. To demonstrate this in the most forcible manner, Mr. Crookes, at the last soirée of the Royal Society, exhibited a little instrument which carried away the most cynical of disbelievers. He had put together, inside a vacuum, a wheel which by the simple action of radiation was set a spinning. The wheel was not a very large one, it is true, and therefore we must not jump at the conclusion that in a short time we shall be able to apply the sun's rays as a motive power for our machinery, and set water-wheels and engines going by the action of light. But the tiny apparatus, in the form of a sort of capstan with little pith balls at the end of the spokes, was shown to move merrily round on bringing into the neighbourhood a strong artificial light, the rays exerting a repellent action upon the blackened spheres as one by one they came under the action of the light. We see that Mr. Crookes is announced to give a lecture on the subject at the Royal Institution early next year, so that we may anticipate further interesting data in regard to this novel property of light.

Christmas cards.—It is very strange that photography has not been brought in to aid in the production of these

little pictorial productions, which are scattered in all directions at this time of the year under the name of Christmas cards. Photography might surely be made available for things of this kind, and the demand for novelties is such that it would be worth anyone's while to consider the subject. We are now introducing photography for many little purposes of an analogous kind, as in the preparation of ball programmes, menus, and the like; but there are probably a thousand Christmas cards sold for every one of these. Pretty snow landscapes, or suitable genre pictures, would be welcomed by the public, and, if nicely mounted and finished, they would fetch a good price; for in many cases, when exchanging good wishes with a friend, one would much prefer enclosing a nicely finished picture, costing, perhaps, a shilling, more or less, than the conventional robin redbreast card, to be obtained, as the recipient knows, at sixpence or eightpence per dozen.

FRENCH CORRESPONDENCE.

HOW TO PRESERVE SENSITIVE ALBUMENIZED PAPER—
AGUADO'S TOURIST APPARATUS—A PRISM PHOTOMETER—
LETALLE'S MODE OF REDUCING CLICHES—CORDIER'S
ADVICE TO PHOTOGRAPHERS.

M. FLEURY HERMAGIS, a laborious experimenter, whose industry never wanes, communicated on Friday last several interesting communications to the Society of France. The first had reference to a method of preserving papers and prints in silver, which had not been fixed, by the aid of essential oils.

As M. Hermagis very justly says, the lack of light, and the slowness of printing by means of salts of silver, render a plan for preserving the whites of an unfixed print, and the purity of sensitive paper, very opportune just now, when we are troubled with dark, wintry days. A process, the discovery of which is due to an American amateur, M. Davey, has served as the point of departure for M. Hermagis' interesting experiments. Very valuable results have been secured by this American discovery, and many persons who have tried the process have expressed much satisfaction in regard to it.

It is only necessary to provide one's self with a box capable of being hermetically sealed; into this is thrown some cotton wool impregnated with citric acid, and the prints may then be placed in the box, not rolled up, being separated from the acid by means of a light frame-work. The prints are moved from time to time, so that the vapours can act uniformly over the sensitive surfaces; and in an atmosphere thus impregnated, the whites will be found to remain perfectly pure and white. It is the same with ordinary albumenized paper, which may thus be kept good for a week or fortnight, and even a month, if it contain traces of citric acid; and if the paper contain as much as three per cent. of this acid, then it will keep good for four months without the surface becoming yellow.

M. Fleury Hermagis observed that this process of preserving sensitized paper will be welcomed by amateurs, because it gives soft, and, at the same time, vigorous, prints—advantages not possessed by prints which are toned as soon as printed. The drawbacks to the process are, that the toning takes some time to perform if the paper contain citric acid, and the tint is not always an agreeable one. For this reason M. Hermagis employs, by preference, ordinary albumenized paper for portraits.

M. Hermagis has tried several other essential oils. Essence of lavender—which, by the way, is seldom obtained pure—gave no good results. As to essence of turpentine, although without any action upon paper prepared with citric acid, it is injurious, rather than innocuous, so far as ordinary albumenized paper is concerned.

Many photographers who employ the process of preservation in question have mentioned the inconvenience of having the fumes of citric acid in the laboratory, as it has a tendency to diminish the sensitiveness of dry plates, and

to fog wet ones. To these complaints M. Fleury Hermagis replies, with truth, that if precautions are necessary, they should be taken, rather than that we should be deprived of an auxiliary of value.

At the same meeting, M. Hermagis exhibited to the members of the society a new tourist apparatus, which was little else than a larger design of the primitive model which he exhibited in the spring, having certain improvements in the details of its construction. The camera is of wood, capable of being employed upright or sideways, with double dark slides, and altogether very compact, while, being constructed entirely of wood, it is very light; the design of the instrument is that of the Comte d'Aguado. The lens is run forward by a screw movement, which renders the bellows unnecessary, and can be focussed at any object from two metres upwards; the mounting is of nickel, so that it cannot rust. The lens is aplanatic, covering a plate 13×10 centimetres perfectly.

It is very certain that the apparatus is constructed in a very ingenious manner, and would render excellent service to tourists and amateurs. It is especially constructed to work with the dry plates of M. Bisson, jeune.

Finally, M. Hermagis presented to the French Photographic Society a new photometer, which no one will consider too complicated in character. It is a simple prism of yellow glass, carrying black lines, which are numbered. This impresses itself in white upon the black ground of a paper sensitized with salts of silver, upon being exposed to light. The prism is of small dimensions, and may be mounted so as to form a charm or trinket to be hung on one's watch-chain.

A French photographer established in Birmingham for some years, M. Letalle, being in Paris for a few days, spoke to us of a process which he employs for reducing the intensity of hard negatives. At our request, this skilful photographer, to whom we are already indebted for several interesting communications, was good enough to show us his plan of proceeding. He took some clichés with very opaque whites, which had been produced either by reason of great contrasts in the objects, or from the model being too much illuminated, and treated them with a dilute solution of permanganate of potash in water, washing and fixing the negative subsequently. If one treatment, which should last about a minute, does not suffice to clear the negative, the operation is repeated until the desired reduction has been secured. A two per cent. solution of permanganate is employed under ordinary circumstances, followed by a fixing solution of cyanide of potassium, also of two per cent strength, but in the case of negatives intensified with pyrogallie acid, solutions of double strength must be employed.*

This treatment of the negative, M. Letalle assures us, does not in any way injure the half-tones and delicate portions of the negative.

Among the recommendations addressed to photographers by M. V. Cordier, in respect to avoiding failures in their manipulations, there are some that specially concern the laboratory, and which, notwithstanding all the attention that they merit, are often neglected. Thus M. Cordier insists upon the necessity of maintaining a uniform temperature in the dark room and in the studio, for if it does not coincide, the plates undergo a transition, and moisture covers the film. In winter, it is well to warm the plates gently before applying the collodion. It is necessary also to warm slightly the different materials before making use of them. In summer, on the contrary, the solutions should be placed to stand in cold water before being used. The laboratory, we are told, must be well ventilated by two wide pipes, fitted so as to admit air without light, one admitting fresh, and the other allowing the foul atmosphere to escape. The dark room should be painted with oil, and the floor-cloth should cover the boards. The alcohol, varnish, collodion, and especially

* For details of M. Letalle's process, see page 593.

the ether, whose fumes, lighter than the air, are inflammable, should be kept far from lamp or fire. The stopper of the ether bottle should be provided with a rubber cap to prevent its being forced out during the hot weather. The baths and vessels containing solutions of cyanide of potassium and hyposulphite of soda should be kept outside the dark room.

When solutions give good results, M. Cordier tells us to refrain from doctoring them; and when they change, he strongly recommends their being thrown into the receptacle for residues, and to prepare them anew. He thinks too much attention cannot be paid to lighting the dark room, and is of opinion that no illumination should be admitted, except through the medium of a double thickness of yellow and red glass; or if the space is to be illuminated by artificial means, then a single candle should be employed, surrounded with orange paper. A uniform mild orange light penetrating the corners of the dark room, even in dull weather, is quite sufficient for working with properly, under ordinary circumstances. If the light comes from the south, a blind of yellow stuff may be placed before the coloured window, so as to be raised and lowered at will. In this way one has always a uniform light at one's disposal, and the sunlight may be prevented from coming through the yellow glass and injuring the negative at the moment of development. If the light comes from the north, it is well to fix up a pattern cliché as a guide for working up the intensity of other negatives.

ERNEST LACAN.

EXHIBITIONS, A STIMULUS TO ADVANCE TRUE PROGRESS IN ART PHOTOGRAPHY.

BY ALEX. ASHER.*

PERMIT me to explain, at the outset, that my connection with the matter for consideration and discussion to-night has been brought about in consequence of a motion I made at a recent meeting of council, to the effect that, as several years had elapsed since an exhibition of photographs was held under the auspices of this society, it would be very desirable that some effort should now be made in that direction, and suggested that we might endeavour to secure, as a nucleus to start with, some of the best pictures from the London Society's exhibition before they were returned to the exhibitors. I was then informed that a suggestion had already been made privately to transfer the whole of the exhibition to this society, but the expense of the undertaking was found to be too great, and it had, therefore, to be declined. My object was not so much to have this wholesale transfer, but rather that a judicious selection should be made, and our own members and others invited to contribute, so that we might calculate on a fairly good average collection of pictures. Most of the members of council, however, were of opinion that it would take members of the society generally rather at a disadvantage, and that they could not exhibit on favourable terms if longer time for preparation were not allowed. It was, therefore, agreed to postpone the intended exhibition until the end of next year, in order that sufficient intimation might be given to all parties concerned in the matter, and that we would then be better able to secure a larger number of contributions from all available sources; and in order that the society's funds might not be burdened with any very heavy pecuniary responsibility in the matter, it was resolved to form a guarantee fund for the necessary expenses connected with the undertaking; and you will be glad to learn that a good amount of encouragement has been already obtained, and the large gathering of members to-night shows an interest in the movement that augurs well for its ultimate success. Former exhibitions of photographic art held in this city, if my recollection serves me right, were not eminently successful in any point of view, and this might be accounted for

by the fact that they were rather too local in character; and it is scarcely to be expected that the outside public will care to patronise an exhibition of mere ordinary photographic portraits that can have no possible interest for any one beyond the mere circle of friends or acquaintances of the subjects. Therefore, such an exhibition as we propose having, next year, if it is to be made successful in its advancement of art progress, and of more than ordinary interest to all, must be largely made up of contributions from the works of the foremost men in our ranks, both amateurs and professionals, at home and abroad; and it is also to be hoped that these exhibits will not merely be a collection of the essences of mechanical perfection of processes, or even of pictures devoid of any definite object in treatment, but let us anticipate, rather, that every exhibitor will strive to uphold the honour of his art by endeavouring to infuse into the composition and general arrangement of his pictorial conceptions as much real art knowledge and originality of ideas in sentiment and feeling as cannot fail to stimulate and promote the advancement of true progress in our art. By so doing, completion in art excellence is encouraged, and wholesome prosperity for the art secured.

In looking back for some time I am afraid it must be admitted (speaking generally) that there has not been that amount of art progress in connection with the practice of photography that might be expected, considering the experience acquired during these years, and this may be accounted for in a great measure by the simple fact that for many years back a great demand has been made on the time and energies of our professional members in providing for the supply of large numbers of the popular carte-de-visite portraits, a style of picture that does not give much space or scope for real artistic ability, so that a large proportion of the profession have been quite content to run in a groove, so to speak, and have not cared to venture much in what may be termed the higher walks of art within the capabilities of photography. But now that there exists a demand for a larger and better class of picture, it is quite apparent that the artistic skill required for these small pictures will be quite inadequate when taxed to produce the necessary amount of artistic excellence required to make the larger pictures thoroughly successful; and if it is admitted that more art knowledge and culture are required for the production of the larger sizes of photographic pictures or portraits, it will also be agreed that this society could not do less than give its name, influence, and support to the proposed exhibition as a certain means of fostering and encouraging our art progress and education in this praiseworthy direction.

The followers of the older arts (painting and sculpture) are upheld and advanced in their progress by the facilities given in their schools of art and annual exhibitions, and they are stimulated to greater efforts in their future labours by the comparisons they are there enabled to make of the works of their brethren, and by the appreciation and encouragement bestowed by a discriminating public on their exhibitions; and if these exhibitions are still considered a necessity for the advancement of progress in relation to arts of such antiquity, how can it be expected that our photographic art can make telling progress if year after year goes on without any special inducement being offered to assist us out of the ruts of a contented or non-progressive art practice?

We have a striking illustration of the increased impetus that can be given by these exhibitions, in promoting art progress in connection with photography, in the United States, where, until within the last few years, they had no special organization for such a purpose. Now they have a very flourishing national photographic association holding an annual congress and exhibition by rotation in the various cities of the Union; and it is said that to our Western brethren, who thought their work left nothing to be desired, their exhibitions came like a new revelation: they found that their most valued productions looked tame, commonplace, and comparatively worthless when placed beside the works

* Read before the Edinburgh Photographic Society.

of masters in the art, the result being that many of them began at once to aim at higher efforts, and every year's successive exhibitions have shown that great progress and success have been achieved through their aid. To come nearer home, it will be remembered that a very great stimulus was given to the artistic abilities of the photographic profession by the exhibited portrait work of M. Adam-Salomon at the Paris International Exhibition of 1867; and certainly nothing up to that time had ever been exhibited that could be at all compared with these pictures—they were simply perfect.

It is not within the province of this paper to treat of the technical difficulties that stand in the way of the artistic photographer being able to give due embodiment to his pictorial fancies or compositions, on account of the non-plastic nature of the materials with which he has principally to deal, but we need not be discouraged—their optical, chemical, and mechanical difficulties can all be overcome. "Nil desperandum!" must be our motto, feeling assured that the more attempts we may make to secure more artistic feeling and sentiment in our work will be most valuable to us as a means of art education, and will, at the same time, serve to unite in a large measure the higher qualities of art and the truth of photography. Without appearing to be invidious in quoting names, we have only to look at the works of the late O. G. Rejlander to learn what has been done in this direction. We can see at a glance what a field is open for cultivation—the production of such a class of subject or *genre picture*. In these pictures we see that variety of true expression and feeling, natural ease of pose, and originality of sentiment, can be successfully secured by photographic agencies; and what has already been so well done is within the reach of all who will make studious efforts to obtain like results.

Now and again it is the practice of some critics, who are jealous of the rapid advances made by photography since its early days, to seek to decry its capabilities, and say it cannot take rank among the fine arts because it is not purely an imaginative or creative art. But it surely will not be denied that the artistic photographer can stamp his individuality upon his work, and, by the aid of his art, give impressions of the conceptions of beauty (whether of forms or sentiment) existing in his mind; and if the ability to do that much is granted, we have, at all events, reason and justice on our side in claiming a position among the fine arts. We can take courage, however, be this as it may, in the knowledge that our art enables us to do more than give merely imaginative effects. The evanescent beauties of rolling clouds and breaking waves have been successfully transfixed; joy and sorrow, and all the varying emotions of the mind acting on the human countenance, have been faithfully portrayed, and the beauties and grandeur of natural scenery can be rendered in the most truthful manner; and even photographic portraiture, in the hands of men of artistic culture and taste, can be graceful in arrangement, expressive and truthful in character, and the *tout ensemble* of the picture will be found thoroughly in accordance with all the rules that guide in art; and the rapidity with which our manipulations are conducted often enable us to "snatch a grace beyond the reach of art."

The appeal that will now emanate from this society to our art brotherhood for their assistance to form our exhibition illustrative of the artistic capabilities and development of the art will, it is to be hoped, call out a host of contributors whose works will show that they are fully competent to sustain and advance the art progress of our much-loved photographic art.

UTILIZING THE SUN'S HEAT FOR INDUSTRIAL PURPOSES.

PHOTOGRAPHY, it appears, is no longer to be the only art which directly utilizes the solar rays for industrial purposes. Mons. M. A. Mouchot, in a recent paper before

the Academy of Sciences, reported in the *Comptes Rendus*, proposes to utilize the heat of the sun's rays, and describes the apparatus whereby he has already worked out successful experiments. The *English Mechanic*, in a good resumé of his paper, says:—

"The solar generator, as he now has it made, consists of three distinct parts—a metallic mirror with linear focus; a blackened boiler, the axis of which coincides with this focus; and an envelope of glass, allowing the sun's rays to reach the boiler, but preventing their escape after they are transformed into obscure rays. He has convinced himself (he says) that the proportion of the heat utilised to the extent of the surface of normal insolation increases with this extent, or, in other words, the productive power of a large generator is better than that of a small.

"He describes the large generator which has been in work at Tours for some time past. The mirror has the form of a truncated cone with parallel bases. The generating surface of this cone makes with the axis an angle of 45 deg.; this, as Dupuis showed last century, is the best form for that kind of mirror, because the incident rays parallel to the axis are reflected normally to the axis, and give a form of maximum intensity for the same aperture of mirror. The reflecting surface is composed of twelve sections of silver plate, supported by a framework of iron, in which they can slide. This arrangement allows of removing each sector in order to clean it, or to substitute for the silver plate polished brass, which produces the same effect. The diameter of the aperture of the mirror is 2.60 metres; that of the bottom is 1 metre; whence it follows that the surface of normal insolation of the apparatus is about 4 square metres.

"The bottom of the mirror is a disc of cast iron, added to diminish the force of the wind. At the centre of this disc rises the boiler, the height of which is that of the mirror. It is of copper, blackened exteriorly, and consists of two concentric envelopes of bell-form, connected at their base by an iron bridge. The larger envelope is 80 centimetres in height, the smaller 50 centimetres; their respective diameters are 28 and 22 centimetres. The water is inclosed between these two envelopes, forming an annular cylinder 8 centimetres in thickness. The volume of liquid should not exceed 20 litres, so as to leave about 10 litres for the steam chamber. The internal envelope remains empty; it is terminated by a copper tube, which opens on the one hand into the steam chamber, and communicates on the other by a flexible tube, either with the motor or with the fire-place of an alembic. A second flexible tube, connected with the bottom of the boiler, serves to convey the water to it. Lastly, on the steam pipe are fixed safety valves.

"As for the envelope of glass, it is a bell 85 centimetres high, 40 centimetres diameter, and 5 millimetres thickness. It allows, then, a constant interval of 5 centimetres between its walls and those of the boiler, and is adherent only by its foot to the bottom of the mirror. Thus arranged, the generator should turn about 50 deg. in the hour, about an arbour parallel to the axis of the earth, and incline gradually to this arbour, regard being had to the declination of the sun. M. Mouchot describes how this is provided for.

"The apparatus acts, of course, only in the sun. The following are some of the results obtained with it:—On 8th May, in ordinary good weather, 20 litres of water at 20°, introduced into the boiler at 8.30 a.m., took, after expulsion of air, 40 minutes to produce steam of 2 atmospheres—that is to say, at 121° C. This steam was then raised rapidly to the pressure of 5 atmospheres, a limit it would have been dangerous to exceed, notwithstanding the regularity of the heating, the sides of the boiler being only 8 millimetres in thickness, and the total steam supported by these sides being thus about 40,000 kilogrammes. Towards mid-day, with 16 litres of water in the boiler, the steam at 100° rose in less than 15 minutes to the pressure of 5 atmospheres, or, in other words, to the temperature of 163°. On the 23rd July, about 1 p.m., when there was unusual heat, the apparatus vaporised 5 litres of water in the hour, corresponding to a production of 140 litres of steam per minute.

"In default of a motor adapted to the apparatus, M. Mouchot used at first a large experimental engine, without expansion or condenser, the capacity of the pump being one-third of a litre. This machine made, in good weather, 80 strokes in the minute, under constant pressure of one effective atmosphere;

it also went when the sun was slightly clouded. Quite recently M. Mouchot has substituted a Berliet's small rotative engine; this has worked wonderfully, and driven at a high velocity a small elevator-pump, which has proved too weak for the generator, and is dislocated.

"Lastly, M. Mouchot has brought the steam from the apparatus under an alembic, and has thus distilled 5 litres of wine in a quarter of an hour. The steam could also be made to rapidly cook vegetables, food for cattle, &c.

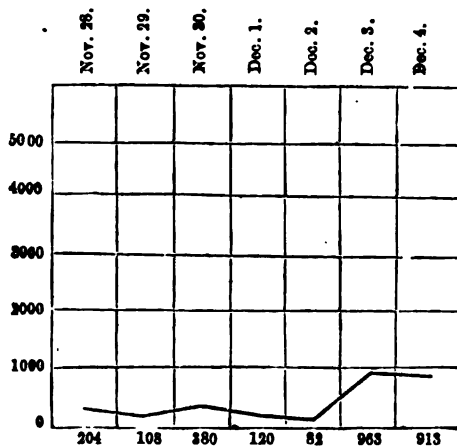
"From the results he concludes that the apparatus utilises, on an average, in that region, about 8 to 10 calories per minute and per square metre. This is, however, only an approximation, because the intensity of the reflected heat constantly increasing from the base to the summit of the boiler, the temperature of the latter is not uniform. The plates of the reflector being only a quarter of a millimetre in thickness, are considered to send to the boiler too small a portion of the incident heat."

METEOROLOGICAL REPORT SHOWING THE DAILY VARIATIONS IN THE QUANTITY OF DAYLIGHT RADIATED FROM THE SOUTHERN SKY AT BLACKPOOL IN LANCASHIRE.

BY D. WINSTANLEY, F.R.A.S.

The aggregate of light during the past week has fallen, the daily average being 395 units, as compared with 728 units during the preceding week. The daily average of light during the month of November has been 552 units, during October 767, and during September 2092.

At a recent meeting of the Edinburgh Photographic Society (on Nov. 3) one of my diagrams was exhibited by the corresponding secretary. Some discussion on the subject, as I gather from the report, ensued, "the outcome of which seemed to be the desirability of some standard unit of actinism which would be understood and generally accepted." "Until that has been attained," say the Edinburgh photographers, "little benefit could be expected from such a course of observation" as I had, in which I have been, and am still engaged. It does not appear to me that so long as observations of the aggregate of daylight are made only by myself, there is any great need for a standard unit which would be generally accepted, as anyone of the days whose light I have measured will serve as a standard whereby to measure any other. I have, however, pleasure in stating in exact terms what my unit of measurement really is. Let a piece of standard paper be prepared (see an article by myself in PHOTOGRAPHIC NEWS, August 6th.) Expose to light until it has assumed the standard tint, and the quantity of light which has been employed is to the unit I have thus far used as .58 to 1.



CHARGE OF DAMAGING NEGATIVES.

M. MAURICE BATISTE, photographer, of Bath, was summoned before the Bath magistrates last week for doing wilful damage to the amount of £1 10s. to two photograph negatives, the

property of John Mordaunt, J.P., of Flax Bourton, near Bristol. Mr. O'Donoghue, of Bristol, represented the plaintiff, and Mr. J. H. Dyer, of Bath, the defendant.

The case for the prosecution was, that some time since the defendant called at complainant's residence, and asked permission to take photographs of his house, family, &c. Permission was granted. The photographs were taken, and specimens having been sent in, an order was given for a certain number, which were supplied. A dispute arose in regard to the defendant's remuneration, and County Court proceedings ensued. The matter was then placed in Mr. O'Donoghue's hands, and he sent one of his clerks (named Bowcher) to Bath to settle the defendant's account. Bowcher visited the defendant at his private house, and offered him the money on the condition that he should at once give up the negatives. At first he said he would not do so, but, after some more conversation, consented. He then brought them into the room. They were six in number, and Mr. Bowcher looked at the two top ones and found them in good order. He proceeded to pack them up, when the defendant said he would do it himself, and left the room with the glasses in his possession, returning some five minutes after with them wrapped up in paper and tied round with string. The money was then paid over, and Mr. Bowcher returned to Bristol. He placed the parcel in his desk, and two days after Mr. Mordaunt, jun., called at the office. The parcel was produced, and it was then found that every one of the glasses was scratched in such a manner as to be useless. The negatives had, it was said, been paid for by the complainant, but this was denied by the defendant.

In cross-examination by Mr. Dyer, the clerk Bowcher admitted that his desk was not kept locked, and there were other clerks who could get access to the parcel, although they had no right to. M. Batiste, when he claimed the negatives, told him that the words "including negative" in the bill meant "taking negative."

Mr. Dugdale, a photographer, of the Corridor, Bath, examined the negatives, and gave it as his opinion that the injury to them was decidedly maliciously inflicted.

Mr. Dugdale was severely cross-examined by Mr. Dyer, and said that in case of views, the negative, unless there was a special agreement, was, as a rule, the property of the photographer. He did not think the injuries could have been inflicted either with the finger-nail or a broken piece of glass.

For the defence, Mr. Dyer argued that the evidence produced was insufficient to prove his client's liability even in a civil court, much less in a criminal one. He should endeavour to prove three things—first, that the negatives were the property of M. Batiste; secondly, that no damage was proved to have been done by defendant; and, thirdly, there was no evidence, assuming such damage had been done, to show that it was done wilfully. M. Batiste had at first claimed the negative as his property, but feeling certain that the complainant would not again employ him, had consented to give it up, and he sent his assistant for him, whilst he (himself) never left the room till he went to pack them up. He was not absent from the room more than five minutes, and during that short time the prosecution said he had scratched each of the negatives. He (Mr. Dyer) would prove to the Bench that he never took the glasses out of the paper in which Bowcher had put them, but simply put on a second wrapper and tied them up. It was not at all improbable that Bowcher might have accidentally scratched them himself whilst on his way to Bristol. In addition, it might have been done at his friend's office. It had been admitted that Mr. Bowcher placed them in a desk where six others could get at them. One of the pieces of glass, they would see, had had the corner broken, and it was very likely that some sharp pieces of glass had got between them and done the injury. Mr. G. Saunders, assistant to defendant, proved that his master did not touch the negatives out of paper, and, in cross-examination, said he thought the broken corner had been caused since the negatives left his master's house.

Mr. Dyer would have called further evidence, but the Bench expressed their opinion that the case was not made out, and dismissed it.

DIAMOND CEMENT, for glass or china, is nothing more than isinglass boiled in water to the consistence of cream, with a small portion of rectified spirit added. It must be warmed when used.

The Photographic News.

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OWNERSHIP OF THE NEGATIVE.

A CURIOUS case has recently been heard before the Bath magistrates, in which the old disputed question of the ownership of the negative again recurs. It does not, however, form the primary element in the case as presented before the Bench, nor does the decision in any way assist in solving the old problem. In this case it seems that M. Maurice Batiste, a photographer, at Bath, had produced, by permission of its owner, some negatives of the residence, at Flax Bourton, of Mr. John Mordaunt, a person of consideration in the district, as we glean from the fact that he is one of Her Majesty's Justices of the Peace; some members of his family being also in the negatives. The negatives were presumably satisfactory, for it appears that, having seen proofs, Mr. Mordaunt ordered a number of prints. Up to this time all is pleasant. The permission to photograph is courteously accorded in response to courteous request, and a number of the pleasant souvenirs of the family mansion, and some of its inmates, ordered and supplied. Then comes the reckoning, often a sad disturber of friendly relations. A dispute arises, the precise details of which we do not know. The stern arbitrament of a county court is involved, and, so far as we can glean from the necessarily condensed account forwarded by a resident reporter, the claim for remuneration is supported by the judge. The legal representative of Mr. Mordaunt sends a clerk to Monsieur Bastiste to pay the account, and to demand, at the same time, the surrender of the negatives. To this Monsieur Maurice Batiste naturally demurred, for, so far as we can see, they were indisputably his own. They had not even been produced by the order of Mr. Mordaunt, who had given permission, not commission, for their production. Finally, he appears to have thought that the possession of the negatives after this rupture would not be a possession worth disputing about, and he consented to give them up, and the attorney's clerk departed with the parcel, doubtless well satisfied that he had been able to settle the transaction satisfactorily. When, however, the parcel was opened by Mr. Mordaunt, he found every one of the negatives scratched, and he arrived at the conclusion that this had been done of malice aforethought, and he charged the photographer with having damaged his property to the extent of thirty shillings.

Of course the gravamen of this charge depended mainly on the real ownership of the property; for if the negatives belonged to the photographer, no charge could be sustained for damage done to his own property. It was necessary, therefore, to establish the ownership as vesting in Mr. Mordaunt, the customer,

before the consideration of the charge of malicious damage could practically commence. The abstract question of ownership does not appear, however, to have been definitely raised. The dispute seems to have been, rather, as to the terms of the contract, or of the bill presented, which contained the words "including negative." These words were intended to mean, in the photographer's contention, "including taking the negative," whilst the customer insisted that they implied the surrender of the negative or negatives; but which view of the case was accepted by the Bench is not stated. The decision appears to have been based rather on the general uncertainty of the evidence upon which the charge of malicious damage was based. It was not certain that the scratches were intentionally done by any one, as they might have been the result of a broken fragment of glass in the parcel. It was not certain that the damage, if done intentionally, was done by the photographer, as the negatives were accessible to others between the time of leaving the photographer's possession and the discovery of the scratches. And on these grounds, without requiring the defence to be completed, the magistrates dismissed the charge as not made out by the prosecution.

At some time, there can be no doubt, the question of ownership of the negative will be settled legally. When the contemplated revision of the whole law of copyright takes place, it is tolerably certain that when dealing with photographs, some attempt will be made to define the question of ownership of the negative, as well as the ownership of the copyright therein. Whether photographers can in the mean time come to some common understanding of the proper position to maintain on the subject, is a point worthy of very grave consideration. Possibly the assumption of a bold position, by the use of a receipt form with a line to the effect that in all cases the negatives and copyright therein remained the property of the artist, unless a specific contract were made to the contrary, might be judicious. One difficulty at the present moment is the want of some mode of taking concerted action amongst professional photographers. The Photographic Society takes no cognizance of trade or professional considerations, and there is no organization which provides facilities for the discussion of such interests, or for combined action if necessary. We have no scheme to propose, but the subject is, beyond a question, worthy of consideration.

BENGAL PHOTOGRAPHIC EXHIBITION.

VARIOUS enquiries have recently reached us as to the best mode of sending contributions to the next exhibition held under the auspices of the Bengal Photographic Society, no especial instructions having been given in the announcements already made, as have been in some former years. Capt. Waterhouse writes to us as follows on the subject:—

"I notice in the News that inquiries are made regarding the best way of sending pictures from England for the Bengal Photographic Society's Exhibition. No special arrangements have been made this year for a forwarding agency in England, but packages can readily be sent by the Indian Overland Parcel Post, through the P. and O. Company, at a cost of about one shilling per pound; or by the Ocean Express, Wheatley's Globe Foreign Express, or by lines of steamers and parcel agencies working between England and Calcutta. Packages should be sent direct to Calcutta, addressed to the Secretary of the Bengal Photographic Society, and should arrive by the 15th January at latest."

DR. VOGEL'S DISCO
GRAPHIC SENSITIVENESS

USE OF THE
"DR. VOGEL'S DISCOGRAPHIC SENSITIVENESS"

FOR EXTENDING
THE PLATE

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actinic rays is materially extended by the application of colouring matters to the films. In a recent letter he says:—

"Since last writing I have continued my experiments in photographing the spectrum on stained dry bromide plates; and though I have not yet finished the investigation sufficiently to arrive at any result conclusively proving the correctness or otherwise of Dr. Vogel's theory, and must, therefore, defer the full account of my experiments, the following brief resumé of some results I have obtained may be interesting.

"In these experiments I have used plates prepared with bromised collodion, without any preservative, well washed and dried. The dyes have been added in some cases to the collodion, and in others applied in watery solution after washing, the superfluous colour being removed by further washing.

"A dry collodion film containing plain, uncoloured bromide of silver is at least as sensitive to the red rays as any of the coloured films as far as regards the extent of the action, but not its intensity. Wet bromide developed with iron has nothing like the sensitiveness of the dry plate, nor has a moist plate developed with the alkaline developer. This has been observed by Dr. Vogel.

"Naphthaline red heightens the action of the yellow rays, decreases that of the green and red.

"Roseine markedly heightens the action of the yellow rays, decreases that of the green, and appears to have the same action as regards the red rays as naphthaline red; but on plates slightly fogged I have observed reversed action, extending below the visible red. The action of the ultra-violet rays, also, seems to be increased by this dye.

"A red dye prepared by Judson, called simply red, smelling strongly of turmeric, increases the action of the yellow rays considerably, and, in a less degree, of the red rays, but decreases the action of the green.

"The action of annatto is something similar to the last.

"I have not quite determined the action of coralline, but it appears to increase the action in the green more than the dyes already noticed. With long exposures, faint action is continued to the end of the visible spectrum, and the blue region is strongly reversed, showing the lines from below H nearly to F with great distinctness, dark on a clear ground.

"Judson's orange heightens the action in the blue and green; below E the action gradually grows fainter, and may just be traced to the end of the visible spectrum. On some plates slightly fogged I have obtained a faint image of the A line reversed.

"Phosphine (Judson's) produces an effect somewhat similar to the orange as regards the blue and green, but all action ceases at D on an unfogged plate.

"Naphthaline yellow seems to weaken the action of the spectrum generally; the strongest action is in the blue, below F; faint action continues to about B.

"Picric acid yellow acts in a very similar way to the last.

"I have not been able to determine the action of green dyes satisfactorily. The mixed greens do not work well in collodion, and when applied in watery solution do not stain the film a good green. I am expecting some suitable samples from Europe.

"Chlorophyll heightens the sensitiveness in the red, with a marked band of increased action about B, as noticed by Becquerel.

"The action of blue dyes is nearly always identical with that of the yellows; strong action is confined to the blue, and then gradually decreases through the green and yellow to about B. I have never had a trace of increased action in the orange with several blue dyes I have tried. On slightly fogged plates reversed action has been distinctly visible on the red above and below A.

"Purple shows strong action between H and F, weak action between F and D, strong action again between D

and C, followed by gradually decreasing action to A; these boundaries of actions being very distinctly marked.

"Violet acts in a similar way to the last.

"In nearly all cases of long exposure of stained and unstained bromide plates the spectrum is reversed in the blue and violet regions between H and F, and in many cases the lines come out with great distinctness reversed, i.e., dark on a clear ground instead of clear on a dark ground. This effect seems also partly due to the action of the alkaline developer, and is more marked on plates of certain colours than on others.

"I have already mentioned a reversed action of the red rays noticed on plates stained with roseine and slightly fogged. This effect has also been observed on plates stained with other colours, orange, green, and blue, but I have found it most marked on plates stained with an aniline blue dye obtained in the market here. In alcohol the solution is of a very deep fine blue, but the watery solution is a rich violet or purple. On plates stained with this dye of a light lavender tinge when dry, and which were slightly fogged after development, I obtained very distinct images of the A and other lines in the red reversed, and also three or four groups of lines in the extreme red below A.

"On plates stained with the same dye, but perfectly free from fog, this reversed action was not perceptible, and direct action with long exposures only extended as far as C. As I had not obtained any sign of this reversed action in the red, or plates prepared with bromide of silver alone unstained, I had attributed it to the action of the dyes, but now it appeared to be evidently connected with the fogging. Recollecting that in the early days of the Daguerreotype, thirty years ago, Sir J. Herschel, Draper, Fizeau, and Claudet had observed a similar reversing action of the red rays on plates that had received a short preliminary exposure to white light, I tried the effect of a similar preliminary exposure of one of the stained dry plates, before subjecting it to the action of the spectrum, and, as I anticipated, a strong bleaching action manifested itself in the red part of the spectrum, and after development the plate showed a reversal of the whole spectrum, from above H to below A, with a minimum of action about F.

"This action of the red rays has not, so far as I have been able to ascertain, been noticed before on collodion plates, and is certainly a most interesting extension of Dr. Vogel's valuable and important discovery of the effect of dyes in modifying the action of the spectrum upon dry bromide plates. I need not mention the practical advantages likely to accrue from the application of this method in spectroscopic photography.

"I have not yet had time to ascertain the action of the red rays on plates stained with other dyes than the particular blue I have mentioned, and subjected to a preliminary exposure to white light, but I know that the reversing action may be expected on many others, and I have reason for believing that under some circumstances it may also be obtained on wet plates with iron development.

"I shall investigate the subject further as I have opportunity—now, unfortunately, very scanty—and hope to make known the results more fully on a future occasion."

EMPLOYMENT OF PERMANGANATE OF POTASH TO REDUCE THE INTENSITY OF NEGATIVES.

BY M. LETALLE.*

To modify any portions of a negative which, from some reason or another, have been rendered too hard, the use of permanganate of potash will be found useful, as by its means the dense portions of the film are rendered less opaque, while the half tones are not altered in any way. The method of proceeding is the following:—

* *Moniteur de la Photographie*.

1. In the case of negatives whose high lights are too opaque, either by reason of the contrast of light on the model, or on account of the opposite photogenic colours of the subject, or in the case of negatives which have been too much intensified with iron and silver, you proceed, after fixing, thus:—Into a beaker or other suitable vessel is poured sufficient permanganate solution to cover the plate, the solution being made up of,—

Water 1000 cub. cents.
Permanganate of potash... 2 grammes.

The liquid is poured over the film and allowed to act for about a minute; the plate is then tilted, washed with plenty of water, and fixed once more with,—

Water 100 cub. cents.
Cyanide of potassium ... 2 grammes.

You wash again, and if the cliché is still too hard, the operation is repeated until the desired harmony has been secured.

2. In the case of negatives intensified with pyrogallol acid, the employment of more concentrated solutions must be had recourse to, either before or after the film has been fixed. Solutions of the undermentioned strength may be employed,—

a.—Water 1000 cub. cents.
Permanganate of potash... 5 grammes.

b.—Water 100 cub. cents.
Cyanide of potassium ... 4 grammes.

This simple method of modifying negatives will doubtless be welcome to photographers, for it has the advantage of not altering any of the delicate half-tones of a negative.

SOME REMARKS ON ENLARGEMENTS.

BY J. C. LEAKE.

At the present moment the question of direct *versus* enlarged pictures possesses the highest interest to all photographers; and it is only to be expected that men who, as a rule, are so much interested in their work, and bring so much careful study as well as ability to bear upon it, will hold opinions of the most adverse character. Nor is this a fact which need be regretted. It is said that "unity is strength," but it should also be remembered that uniformity is often weakness. There is, happily, a perfect unity among photographers as to one important matter, inasmuch as they are all aiming at producing works of the highest character, and of this the very diversity of the processes employed is proof positive. For ourselves, we have no hesitation in declaring that we are in favour of enlargements, and we hope to be able to show in this paper that we have right on our side; if not, we only hope that our photographic brethren will at once set to work, with good will, and make converts of us as speedily as possible.

But it would be of small service to merely state that we are in favour of this or that process, unless we could give some reasons for our preference, and in this case reasons seem to be "as plentiful as blackberries." One meets us at the very outset,—the difficulty of obtaining and working with large lenses. We will suppose that we wish to produce pictures upon the whole sheet of paper—that is to say, twenty-two inches by seventeen—in how many of our studios, in London at any rate, shall we find the necessary lenses and cameras? while if these be forthcoming, upon how many days in the year can they be employed? It is true that our Dallmeyers and Voghtlanders have brought all their skill to bear upon the construction of large lenses, but yet there is the obstinate fact staring us in the face that these instruments, excellent as they are, do not give such perfect definition; and, more important still, do not work so rapidly as those of smaller size.

Besides this, however, there is another matter of nearly

equal importance—namely, the expense of working on plates of large dimensions.

One cannot always succeed, sitters will move, and the formula, "Fix your eyes upon that spot, and put on a pleasing expression," does not always act like a charm, especially where the sitting is prolonged for whole minutes. What chance should we have of persuading Jenks' baby to sit still for even a minute? and if Jenks himself had tried what it means for himself he must be totally devoid of parental feeling if he allows his offspring to be submitted to the ordeal. Seriously, however, the facts that the exposure must necessarily be of a prolonged character, and the light really first-rate, are sufficient to make us hesitate before adopting large lenses and direct pictures. Another point for consideration is this: no photographer of standing would wish a sitter to keep a picture with which he was not satisfied, and, unfortunately, our sitters are not always easily pleased. Now in this case there would be nothing for it but to keep taking the discontented man over and over again, a proceeding not likely to be pleasant, or profitable either, to the artist or his client. On the other hand, if only small negatives were taken, two or three would be made at once and submitted for approval; while even if these failed, the cost and trouble of a resitting would be infinitely less than in the former case.

There is, however, no need to multiply cases. Every practical photographer will admit these facts, namely, that large lenses are more costly, more troublesome to work, do not give such perfect definition, and are slower in action than those of smaller size, and that, consequently, the cost and difficulty of working are greatly increased.

If, then, we are willing to admit that these serious difficulties are inevitable when working with large lenses, and taking large pictures direct in the camera, the practical question at once arises, How are we to make enlargements which shall, at any rate, be equal to direct work in the camera?

This is a large question indeed, and one which requires much consideration before a satisfactory answer can be given. Very much will depend upon the circumstances of the case. One thing, however, is certain, namely, that it is a matter of vital importance to secure a tolerably permanent result. It is useless to go on making pictures which, some day or other, must fade. And as we believe that the most important branch of the photographer's work will be that of making large portraits, so we are convinced that the utmost care must be taken to ensure permanence, if the art is not to be allowed to fall into utter decay. Whatever process, therefore, be employed, it must be one which gives promise of stability in the finished picture.

Bearing this in mind, we have to consider which process out of the many now known will produce the best results, being, at the same time, workable at a moderate cost, and tolerably well available for various classes of portraiture.

There are two great classes into which enlargements may be divided—namely, those by the direct method, such as the ordinary solar camera pictures and collodion transfers, and those by the double, or, perhaps, rather treble process of making first a transparency; then an enlarged negative; and, finally, a print by any of the known methods. Of these we have to choose. The solar camera prints are so well known that we need not make any remark upon them. If well washed—which, we hope, we may observe without offence, they are not always—they should be tolerably permanent, although they may be ranked among the "dangerous class" of photographic prints. But there are very few indeed of these which make presentable pictures without working up; and, as this working is usually very extensively employed, we may dismiss this class of picture from our consideration of enlargements from a purely photographic point of view.

Of the collodion transfers, we shall merely observe that

they are simply worked, and, doubtless, permanent in a high degree.

The now generally adopted process—that of making an enlarged negative—is, in many respects, excellent, as it allows of a final printing of the proof in permanent pigment. This process is, however, of necessity more troublesome, and consequently more costly, than the direct methods of enlargement; as there are, of course, the three operations to be performed of making a transparency, a negative, and a print. Moreover, there can be no doubt that in nearly every case the enlarged negative will require considerable work before a presentable picture can be produced from it—a fact which must be taken into account when processes are varied from a commercial standpoint.

It would appear, then, that there are two courses open to the photographer—either to take an enlarged negative or a transfer—the question being which is the best method to adopt. In all probability, both will eventually be extensively employed. The chief difficulty in the way of the negative process arises from the fact that in most cases but one or two prints are required, and that the cost of production is thereby materially higher than if these could be made by the direct method. On the other hand, the collodion transfers hitherto produced have not been altogether successful, on account of their cold and unpleasant tone. Whether these defects can be overcome remains to be proved. We think they can, when this will at once become one of the most important of all photographic enlarging processes, being at once simple, cheap, and easily available by every photographer. Besides this, our experience has been that a direct enlargement from a negative is, in many respects, superior to one two or three times removed, inasmuch as all defects, either in the transparency or the second negative, must of necessity be reproduced in the final result.

We have been led to make these observations on account of the remarks frequently made as to the best process of enlargement by many photographers; and because we consider that there really is no test, but that each of the two mentioned in this paper possess some qualities which will render them useful.

Correspondence.

COLOURED COLLODION ON THE BACK OF THE NEGATIVE.

DEAR SIR,—In your issue of December 3rd I see that M. Fritz Luckhardt has invented a method of retouching which gives good results. By putting an alcoholic solution of aniline red into normal collodion, and applying it to the back of the negative, I have done a similar thing two or three years ago, not thinking so simple a thing worth publishing. Instead of using aniline red I use Judson's dyes, any colour I think the best for the subject in hand. I drop a few drops of the dye into the collodion, and scrape off with a knife what I don't want covered; I find it a very good plan.—I remain, dear sir, yours truly, N. PEPPE.

RAPIDITY OF MR. KENNETT'S GELATINE-GELATINO PLATES.

DEAR SIR,—I find in the notice in your pages of Mr. Warnerke's clever arrangement of roller dark slide and films, your contributor there gives his opinion that with present light, and in a well-lighted studio, a tolerably good negative may be secured in from forty to fifty seconds' exposure; but with dry plates, let the exposure be what it may, never will a negative be secured worth talking about; or, in other words, he looks upon the thing as an impossibility to secure a tolerably good negative with a dry plate at this time of the year. He also cites Mr. Warnerke's opinion to the same effect. Mr. Warnerke, I think, spoke

only of his own plates when he admitted they were not so rapid as he at first thought them. If he spoke for himself, he ought to know best if he was right or wrong; if he spoke generally, then I say both he and your contributor are wrong. It is at all times hard to bring our minds to disbelieve in what we have been taught all our lives to believe in; in this case, photographic lives I mean. And here I see your contributor is no exception to the rule, as it is evident he does not believe in dry plates, unless in a strong light. Now I have proofs of the strongest character to the contrary, and am prepared to show that dry plates can and are made that will not only do the work as well in a dull light as a wet plate, but will do it in even a shorter time than the wet plate.

I certainly have been known in the photographic world but a short time, although for amusement I have followed photography for more than a quarter of a century; and I don't expect for a moment that my opinion would stand for much with photographers generally, against that of a gentleman writing under editorial sanction in the PHOTOGRAPHIC NEWS; but in this matter of dry plates I am so convinced that he is wrong, that unless he has quite made up your mind not to be convinced, I will even convince him and you of the error of the belief stated. I herewith enclose you a print, the negative of which was taken in the middle of last December, the time of exposure twelve seconds, with Dallmeyer's No. 2a, time of day half-past twelve. The plate was coated in the May previous, or six months before exposure.

Now this is not a picked plate out of hundreds exposed, but simply a plate taken at random, from others put aside to try their keeping qualities; the exposure was made by Mr. Havill, of Bond Street, and in his studio.

Now, after this publicly expressed opinion on the capabilities—or, rather, the incapacities—of dry plates, and your examination of the print (the negative you shall also have if you wish to examine it as well), I ask if you will give a candid and unbiassed opinion as to the inferiority of it to a wet plate taken under the same conditions of a December light? As to the time I will say nothing, as that, you will observe, is just about one-fourth that, in your pages, it is said a tolerably good negative with a wet plate might be taken. I believe you have seen the interior of Beverley Minster, taken by Mr. Willis, of Scarborough. They certainly cannot be said to be taken in a good light, yet one was taken in one minute and ten seconds; the other in one minute. I think you will have to withdraw your implied indorsement of the expression that, with a bad light, dry plates will not answer under any circumstances.—Yours truly, R. KENNETT.

[The opinion of the gentleman of our staff, writing under the heading "Photography In and Out of the Studio," is, beyond a question, true of the majority of, but not of all dry plates, and his experience that of the majority of dry plate workers. In regard to some of the rapid dry plates issued commercially, the manufacturers definitely announce that they are unsuitable for exposure in a bad light. But our correspondent should remember that in general photographic terminology the term "dry plates" without other qualification is always understood as meaning "dry collodion plates." Cielotype and albumen plates are designated by their special names; and so with Mr. Kennett's gelatine plates. So far as we know, the rapidity of his plates is not doubted, and the examples, which are excellent—one a perfect portrait, the other a fine interior—confirm all he says on the subject.—Ed.]

FROST IN THE STUDIO.

DEAR SIR,—The following iota of advice may, perhaps, save some of your readers both £ s. d., and inconvenience. In frosty weather empty all the water out of the syphon of your washing trough, or you may find it broken and filled with ice.—I remain, yours truly, FRANK M. SUTCLIFFE.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held in the Hall, 5, St. Andrew Square, on the evening of Wednesday, the 2nd inst., the president, Dr. THOMSON, in the chair.

The minutes having been read and approved, Messrs. James Gordon, M. Macgregor, D. Taylor, D. Cuthbert, G. F. Blaikie, M. W. Galloway, W. Hislop, I. Oswald, F. P. Moffat, and J. Macfarlane were admitted ordinary members.

THE PRESIDENT said that before commencing the ordinary business of the evening, he thought it right to inform the members present, and through them the Society generally, that at the instigation of Mr. Asher the council had had under their consideration the desirability and practicability of getting up an exhibition of photographs which should be open during the latter end of this and beginning of next month; but after several meetings had been held, and certain enquiries made, it was considered best to postpone the effort for another year, partly from financial considerations, and partly because, by the short notice, possible contributors here would be taken at a disadvantage. It had been resolved, however, that immediate action should be taken with the view of organizing such an exhibition, to be opened in December, 1876, on a scale not hitherto attempted in this part of the country. While he thought, from the way in which it was proposed to carry out the arrangements for the proposed exhibition, it would in all probability be a paying concern, it would be evident to the members that the Society must be protected from any possible loss, and for that purpose a guarantee fund must be subscribed; and he was pleased to be able to inform them that a good beginning had already been made in that direction, Mr. Davies having just informed him that a sum of over sixty pounds had been subscribed by a very few friends. Before the exhibition had been spoken of, it had occurred to him that some of the surplus funds of the Society might be well spent in the purchase of high-class photographs for the album, where members might have an opportunity of studying them, and from which they could not fail to derive considerable benefit; but probably the object might be better attained by throwing their energies into the work of getting up the proposed exhibition.

MR. ASHER then read a paper on "Exhibitions, a Stimulus to Advance True Progress in Art Photography" (see page 591).

THE PRESIDENT thought that the members were much indebted to Mr. Asher for the lucid manner in which he had brought the claims of the exhibition before them. One great object of photographic societies was the furthering of true progress in all departments of the art, and he had no doubt that the tendency of exhibitions was to show what was doing in all parts of the country, and, by drawing out the best work of the best men, they would be enabled to see exactly how far they were behind.

MR. W. NEILSON said he highly approved of the President's suggestion to apply some of the Society's surplus cash in the purchase of first-class photographs. He held the belief, which was now widely entertained, that exhibitions, instead of elevating the public taste, rather trained artists down to suit the popular demand. He would not support the proposed exhibition, as, instead of being a collection of bona-fide photographs, it would consist, to a large extent at least, of retouched productions. No doubt prints of that school sometimes showed that the negatives had been painted with much skill, but in a general way, in spite of their being imposingly styled the "higher art," he could not help regarding them with extreme dislike. An exhibition of untouched photographs would, he thought, be of much benefit, and it would receive his hearty co-operation; but such an exhibition as that now proposed he could not support. Mr. Asher, he thought, had missed the true point in his paper, which he considered to be the fact that a large and imposing exhibition would, if it became popular, set the public a-talking, and, by increasing the interest in photographs, give a much needed stimulus to photography as a trade.

DR. JOHN NICOL agreed with almost all that Mr. Asher had said, and had no doubt that from the zeal which he had infused into the council, the proposed exhibition would prove a triumphant success. He was glad that the question had been raised in such good time, as, while it would let photographers

in all parts of the world know that they were invited to send pictures to Edinburgh, it would stimulate the members of the Society to greater care in the work of the coming season, as they would always feel that each negative that was being developed might be worthy of a place in the exhibition. There was one portion of Mr. Asher's paper, however, to which he must take exception, namely, that in which M. Salomon's pictures were said to be "simply perfect." The Society, he thought, could hardly let that go forth as the opinion of the members, without some qualification. It seemed to him necessary to distinguish between a perfect photograph, and a picture that had been made what it was by other than photographic art. Now it would be remembered that when M. Salomon's exceedingly beautiful pictures first made their appearance in England there was much diversity of opinion as to whether they were purely the result of photography, or whether they did not owe much of their beauty to skillful touching up, and that, with a view to set the question at rest so far as the print was concerned, a fine copy was brought to one of the meetings, and, in presence of the members, removed from its mount, and washed with a sponge, the result being the removal of such a quantity of colour as to leave the print in a very different state from that in which it originally was. No one, he continued to say, could admire the pictures of M. Salomon more than he did, but he held that a picture that depended for much of its beauty on the skillful application of the artist's brush was not correctly described by the title of a perfect photograph.

MR. BASHFORD fully endorsed Mr. Asher's sentiments, as he believed that an exhibition properly managed could not fail to benefit all concerned. He had no sympathy with the views held by Mr. Neilson, and hoped that the exhibition would not be one of photographs pure and simple, but of photographs finished by an artist of sufficient skill to supply the deficiencies of an imperfect instrument, which the camera undoubtedly was. He admired the works of M. Salomon very much, and although they might in some cases be largely wrought up by the brush, he had one in his mind's eye that had been vastly improved by skillfully directed pencils of light being made to act on the print. He attributed the present high position of the photographic art mainly to the admirable example set by M. Salomon. People, he said, will not now accept the hard, untrue pictures as turned out by the camera alone, and he had no doubt that the public would continue to insist on the necessity for the restoration by the artist of that which the camera takes away.

MR. DAVIS said that the question under discussion was no question of trade; it was simply, What can photography do for art? And the exhibition was intended to answer that. It will show, not that photography is indebted to art, but that art is indebted to photography; and the two should come together as twin sisters. He thought Mr. Neilson was a little too strong in his condemnation of retouching. There was hardly a negative that might not be improved by a skillful application of the pencil or the brush, and he could see no reason why they should not accept the aid of their hands in making the improvement. That photography can be made to produce very high class work, is abundantly evident from the work of the late D. O. Hill, in the album now on the table; but that is no reason why it should not, if possible, be improved by a resort to any and every means by which it may be done.

THE PRESIDENT said that retouching might be done by chemicals, as well as mechanical means, and instanced the practice of the late W. D. Clark, who was in the habit, when developing his collodio-albumen plates, of protecting such portions as were sufficiently intense by a coat of varnish, and returning the negatives to the developing solution. This was repeated again and again; in some cases, as many as twenty times, until he had got every portion of the negatives to his satisfaction.

MR. DOBBS thought they were wandering from the question, which was, Are exhibitions calculated to advance, foster, and encourage art in photography? Pictures of a high class had been, and were being, produced by the aid of photography, and he maintained that the photographer was entitled to manipulate in any way he chose, for the production of that which would best please his employers. He called in question the truth of Mr. Neilson's statement in regard to exhibitions generally, and believed that they had accomplished much good. Frequent visits to our annual exhibition of paintings enabled men to become no mean judges of the merits of a picture, and a similar result would undoubtedly be the effect of an annual

exhibition of photographs. He held that the Photographic Society would be fully justified in organising such exhibitions, and inviting all the people in the country to come and be educated. It was a well-known fact that numbers of the best workers were in the habit of going to London on purpose to see the annual display there, and they generally come back full of praise of what they had seen, and were always better for having had before them something high at which to aim. One of the first-fruits of such an exhibition was the higher education of the photographer himself, and, through him, his customers also become elevated in their tastes. By attempting a high-class exhibition, they would be trying to raise the standard of photography as an art in Scotland, and therefore he thought the sympathy of the meeting should be with Mr. Asher, and hoped the Society would go heartily into the undertaking.

Mr. ASHER, in reply, said that he remembered something of the dissection of Salomon's picture, mentioned by Dr. Nicol, and he thought at the time, and still thought, that it was subjected to cruel treatment. He had twice visited M. Salomon in Paris, and had been permitted to examine his negatives and method of working, and could assure the members that nothing more perfect had ever been produced. With regard to missing the point of his subject, as had been stated by Mr. Neilson, he most distinctly maintained that he had not. That the stimulus to public interest in photography given by an exhibition was likely to give an impulse to photography as a trade, he considered quite possible; but he thought that a very low view to take of the subject, and if there were no higher object to be attained, he, for one, would have nothing to do with it. But aside from that, if Mr. Neilson had looked at the title of his paper, he would have seen that his object was to show the effect of exhibitions on art, and not on photography merely as a trade. No doubt the professional photographer was under the necessity of giving a certain amount of attention to the commercial department of his business, but he believed that the more his mind was given to the commercial, the less likely was he to attain eminence in the artistic, and he had no doubt that the converse of this was equally true.

Mr. W. NEILSON then brought before the meeting a safety dipper, the invention of Mr. Smith, of Bedford, having the two-fold advantage of non-liability to break, and the impossibility of the plate slipping off. The dipper may also be used as a holder for coating or developing plates. It is made of hard wood, and in form like the letter U, with the lower leg elongated. On the two upper legs, which form the lower end of the dipper, are two pins on which the plate rests, and along the long leg, which forms the handle, is cut a groove. A strip of wood is dovetailed into this groove, and slides easily up and down. The plate is placed on the two pins, and the sliding piece pushed down, and as it has a notch on the end which fits on to the edge of the plate, the latter cannot be removed till the slip is pushed up again. Mr. Smith states that he soaks the dipper for some hours in an old bath, after which it may be used without fear of injuring the silver solution; and that he has had one in constant use for fifteen years. The dipper was examined with much interest, and the design very much admired.

Mr. DAVIES said that Mr. John Thompson, when in China, had broken his only dipper, and made one by tying together three pieces of bamboo in the form of a triangle with two long sides, and that he had used it satisfactorily through his whole campaign. Some time ago he (Mr. Davies) had made one in a similar way, but it had thoroughly bamboozled him, as it had so injured the bath that no amount of potash permanganate was sufficient to remove the organic impurities which it had acquired.

Mr. BASHFORD suggested ebonite as a suitable material for its construction, and had no doubt that it would be found a very popular tool. In the absence of ebonite, he recommended that the wood should be strongly heated, and then dipped in melted paraffin, which he knew from experience would render the dipper perfectly harmless.

Dr. NICOL thought the dipper the best that he had seen, and should get one made at once, as he had often felt the annoyance of a plate slipping off, and of the glass dipper getting broken under circumstances where it was not easily replaced.

Dr. NICOL then laid on the table a large number of photographs—a portion of his work during the season—and said that at last meeting, when, in consequence of an invitation in the billet, a number of the members had brought their summer's work for inspection, he felt that the time at their disposal did

not admit of anything like a proper examination, or of any discussion on the merits of their productions. He then suggested that, instead of all the members' work being shown in one evening, one only should exhibit his pictures, and invite criticism, each evening. In this way ten minutes at the end of each evening might be profitably employed, as if the more experienced of the members would only speak out freely, pointing out the faults and suggesting improvements, much valuable information would be elicited. He then handed the pictures round the table; but although many were ready with praise of several, considerable difficulty was experienced in getting up the kind of criticism courted.

Votes of thanks were given to Mr. Asher, Mr. Smith, and Dr. Nicol, and the meeting adjourned.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual meeting of this Association was held on Tuesday, the 30th ult., at the Free Library, William Brown Street; the President, the Rev. J. D. RILEY, in the chair.

The minutes of the previous evening were read and passed.

The Secretary then read the following:—

Annual Report.

In bringing before you the twelfth annual report of this Association I am still able to say there is no falling off in its prosperity. By death and resignations we have lost five old members, but new ones are taking their places, and I do not doubt but that our numbers will steadily increase.

Few papers have been read this session, but the meetings have been well provided with interesting objects and specimens of the different processes, thus supplying plenty of material for discussion.

Mr. W. ATKINS read a paper on "The Keeping Qualities of Pellicle Emulsion," and Mr. T. CLARKE one on "The Beer and Albumen Process." Mr. ELLERBECK gave an exhibition of chemical experiments with the aid of the sicopticon. A popular lantern exhibition was given, which was largely attended, and gave much pleasure to both members and their friends. A special meeting was held, at which Mr. Taylor gave a practical demonstration of the working of the autotype process. The gelatine pellicle process and the collodio-bromide pellicle process have been prominently brought before the members during the past year.

The excursions have been to Lymm, Buildwys and Much Wenlock Abbeys, and to Llangollen; but the attendance, owing chiefly to the unfavourable state of the weather, was very small.

The balance in the hands of the Treasurer is satisfactory, being £25 3s. 5d.; out of which, however, will have to be taken the cost of the presentation print for the past year.

The members then proceeded to the election of officers for the year 1876. The following were elected—*President*—Mr. W. ATKINS; *Vice-Presidents*—Rev. H. J. PALMER and A. TYLER; *Treasurer*—Alfred TYLER; *Hon. Secretary*—Wm. MURRAY, 58, Dale Street; *Council*—Rev. J. D. RILEY, Thomas CLARKE, W. M. FENDIEBURY, W. B. ROBERTS, and L. W. WEBER take the place of those retiring.

The usual votes of thanks to the retiring officers were carried.

The Rev. R. E. BATTY was elected a member of the Association.

A large number of photographs were exhibited, being the year's work of the Rev. J. H. PALMER, the Rev. J. D. RILEY, H. HOULGRAVE, W. H. KIRKBY, and others.

Mr. J. H. T. ELLERBECK exhibited some of the flexible negatives taken by Mr. Warnerke's process. He (Mr. Ellerbeck) said that to use the process advantageously necessitated the use of the roller slide. This was expensive, but he had found no difficulty in attaching the tissue to glasses by means of india-rubber solution. These were put into the usual dark slides, and when exposed the films were detached from the glass—which was readily done—and put aside to await development, and other sensitive tissue replaced on the same glasses. By this means half-a-dozen glasses only were required for a lengthy tour, the weight of a large number of tissues being but little extra. He found them as sensitive, if not quicker, than the Liverpool plates.

In reply to a question how he was able to get his gelatine negatives so much denser than formerly,

The Rev. H. J. PALMER replied that he had used the plan recommended some time back in the journals for intensifying

collodio-bromide negatives, viz., by immersing the negative in a solution of two ounces of chloride of copper to ten ounces of water. This caused the picture to disappear; but after well washing and redeveloping with a drachm of solution A to one ounce of solution B the picture could be brought out with any desirable intensity.

A.—One ounce of ammonia to eight ounces of water.

B.—Three grains of pyrogallie acid to one ounce of water.

A trial then took place as to which was the better lantern lamp—the sciopticon or the Turnbull. Mr. Atkins exhibited the sciopticon, and Mr. T. Clarke the Turnbull lamp. After a trial in various ways, showing transparencies, and also with and without reflectors and condensers, the verdict was pronounced in favour of the sciopticon.

The SECRETARY then gave a practical demonstration, showing that with the simplest appliances nothing was easier than to prepare transparencies with the Autotype tissue.

The meeting was afterwards adjourned until the end of January, 1876.

Talk in the Studio.

THE PHOTOGRAPHIC SOCIETY.—The next meeting of this Society will be held at 9, Conduit Street, Regent Street, on Tuesday next, the 14th inst., at 8 o'clock, p.m., when Mr. Viles will read a paper "On the manipulation of large plates in the field." On January 11th, 1876, C.J. H. Stuart Wortley will read a paper, the title of which will be announced in due course.

ANNUAL DINNER OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The annual dinner of this Society will this year take place on Saturday, December 18th, at Anderton's Hotel, Fleet Street. Carrying out its essentially fraternal character, the Society does not confine the re-union to members only: photographers and friends generally, who wish to be present, can obtain admission, by communicating with the Hon. Sec., Mr. Edwin Cocking, 67, Queen's Road, Peckham.

TILLEY'S NATURAL BACKGROUNDS IN PORTRAITS.—Mr. Tilley has sent us some examples of his mode of introducing natural backgrounds, which admirably illustrate that from the same transparency it is possible to produce either soft, distant, atmospheric effects, or the most sharply defined effects of close scenery.

ORNAMENTAL ENTOURAGE FOR PORTRAITS.—We have been favoured by Mr. S. G. Payne, of Aylesbury, with some examples of very pretty ornamental entourage in portraits: a graceful combination of ferns, flowers, grasses, and ribbon tastefully wreathed around a neat oval frame, into the centre of which the figure is vignettied, on a light ground; the framework being produced on a dark ground. The effect is very pretty, and would add much to the interest of portraits intended for presents. Some groups of chrysanthemums are prettily arrayed and admirably photographed, and will serve capitally for drawing copies, for which they are intended.

THE PHOTO-ENGRAVING CO., New York, has issued some very creditable specimens of printing blocks produced by photography. The process used is that invented by Mr. J. O. Moss. A negative is first taken of the subject, which must consist of black and white dottings or lines, that after acquaintance with a secret department, appears as a plaster mould from which a stereo is obtained. The "proof" taken, the plate is passed to the finisher, an expert wood engraver, who supplies deficiencies. Speaking from results, the process resembles Dallas's. The copy must consist of sharp black lines on white paper.—*Stationer.*

ACETIC ACID.—A new process for manufacturing acetic acid has been taken up by the Tyne Acetic Acid Company. It consists essentially in taking advantage of the property of chloride of calcium and acetate of lime to form crystals of the double salt, to eliminate the tarry and other objectionable matters. By the new process a pure acid, well adapted for pickling purposes, is cheaply produced.

To Correspondents.

CHROMO.—The production of a "dull yellow" or "citrine" print used to be at one time a matter common enough, and more photographers were anxious to know how to avoid than how to effect it. As a rule, long immersion of an untuned print in a somewhat weak acid solution of hyposulphite of soda will produce

the result you desire. Or, if you immerse an untuned print in an ordinarily good and fresh fixing bath, and then place in water made very slightly acid, and allow it to remain some time, you will probably obtain the result you require.

B. J. BILLING.—Soda water glass is simply silicate of soda, and may be obtained without difficulty of most chemists.

IODIZER.—The production of pure whites and intense blacks is always difficult in developed prints. It is not very difficult to get intense blacks if you prolong development, and, if necessary, add silver to the developer; but there is always risk of 'spoiling the whites. We cannot give you better formulae than you will find in the work in question. Care and skill in manipulation alone will help you, as the formulae in question are excellent. In the first place, it is important to have good paper; in the next place, it is of vital importance to keep the paper from light in every stage of the process; and in the next place, the amount of exposure is very important. If these points are regarded, and the formulae you mention used, very good prints may be secured. Personally, however, we prefer producing an enlarged negative, and printing direct.

THE DAMAGE TO NEGATIVES AT BATH.—Since our article on this subject was in print, a "Western Photographer" sends a newspaper paragraph containing the same details, and adds a few comments which are to the purpose. He says:—"I know nothing more of the case than what is here reported, but I may perhaps be allowed to say that I think it a pity that M. Batiato should have so far recognised the plaintiff's demands as to have given up the negatives. Photographers should always be careful, either in taking or executing orders, never to admit that the negatives belong to their customers; and should it ever happen for this to be tried in a court of justice, I hope that all photographers will combine to resist such a demand, by supporting the unfortunate one who has to fight the battle."

CONSTANT READER IN TROUBLE.—Your troubles being one with which we have never met, it is somewhat puzzling, and can only be met by an exhaustive process, trial after trial. We should change the developer entirely, and try one of a simpler character. Try the following:—Water 1 ounce, protosulphate of iron 15 grains, acetic acid 15 minims, spirits of wine *quantum suff.* Glycerine is at times difficult to obtain pure, and it may possibly be a source of trouble. Thanks for the newspaper cuttings, which were interesting, and showed in a gratifying manner how a good man may maintain the status of his profession by himself being worthy of respect.

C. KNIGHT.—Your negatives sent for examination certainly present a variety and complication of symptoms which seem to defy diagnosis. Collodion and bath seem alike out of order, and we should be strongly disposed to discard both, and begin *de novo*. The collodion is either old and rotten, or it has been made from bad pyroxylene and weak solvents (that is, solvents containing too much water). The silver bath, we should judge, had been made from impure distilled water. With such a complication of bad conditions, pinholes, crappiness, varied stains and zigzag marks, and a general rotten granular condition of film, you should have given us some details of history and treatment. On an examination of negatives, without further details, we can simply suggest a new silver bath, and another sample of collodion.

Several Correspondents in our next.

B. L. D.—Much depends on circumstances; both collodions are good for different kinds of work. On the whole we should prefer No. 1 for ordinary portraiture. 2. We think it is good economy to maintain the temperature of studio and dark room between 50° and 60° Fah. A steady temperature of 50° feels, by comparison with the outer atmosphere, tolerably comfortable; but that is the lowest temperature at which the chemicals should be kept. A 35-grain bath is, on the whole, better for winter than the usual 30-grain solution. A hot iron developer is sometimes useful in a bad light; but it requires working with care and judgment, or fog will be the result.

M. R. D.—During the frosty weather it is often absolutely necessary to warm hyposulphite solution, as, at a low temperature, it loses its fixing capacity. It is a good plan to make it with warm water, and use it at about 60°. See answer above to B. L. D.

Z.—The reason, we presume, why, in the majority of photographic portraits, the shadow is on the retiring side of the face is, that it is easier to work so, and secure relief and modelling; and that, in the majority of cases, it is most effective so. In some portraits by great painters the retiring side is lighted, and the nearer portion kept in mesozoia. This, when well managed, and with suitable faces, is very effective. Occasionally it is done with advantage in what are termed the "Rembrandt" portraits.

BOOKS RECEIVED.—"Old English Homes," by Stephen Thompson. **RECEIVED,** with thanks, communications from W. T. Wilkinson, B. Wyles, R. S. Griffith, E. Viles, J. P. Smith, Roger Laurent, J. Martin, J. M. Young, T. Tedrake, J. T. Hackett, A. Borland, Wm. Heighway, R. Mitchell, Captain Torton, J. Brier, jun., J. Talley, C. R. P. Vernon, T. Hicks, K. Cocking, Sydney Smyth, C. Ferranti, G. S. Pezany, F. Bedford, W. E. Batho, and others.

The Photographic News, December 17, 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

RECONNOITRING FROM BALLOONS—A NEW SENSITIVE PHOTO-METER—SUCCESSFUL PHOTOGRAPHERS.

Reconnoitring from Balloons.—The study of balloon photography, and more especially reconnoitring from balloons, will receive a serious check from the recent accident in Paris. For some years past it has been sought to utilise the balloon for military observation, and in the wars of the first Napoleon a balloon corps existed for the purpose of reconnoitring the enemy. In this country, also, considerable attention has been given to the subject, and about fifteen years ago Mr. James Glaisher, F.R.S., the President of the Photographic Society, gave his assistance in making some ascents at Woolwich. In this instance the matter was not carried very far, and, indeed, beyond the marching about of a few thousand men in the neighbourhood of the aeronauts with a view of ascertaining how much could be seen of the evolutions of the troops from above, the authorities would not consent to carry on experiments. Nadar, the well-known photographer and aeronaut of Paris, who gave considerable assistance to the French Government in carrying on the postal service *par ballon monte* during the siege, brought the subject of balloon reconnaissance once more forward in France a few years ago, and this clever inventor succeeded in devising a simple apparatus for taking instantaneous photographs from the car, such as would be extremely useful to an advancing general, or one unacquainted with the country in the neighbourhood of his forces. Nadar experienced great difficulty in taking a picture fast enough, and also in shutting out from the camera the bright oblique rays coming from the sky; but he succeeded in the end so admirably that the late Sir Charles Wheatstone called the attention of several photographers over here to the fact, and urged the necessity of practising balloon-photography in this country. After M. Nadar's experiments come those of M. Tissandier, whose hand-book of photography has recently been published in this country, and who, it will be remembered, barely escaped with his life a little while ago, when two of his companions were killed by reason of the great altitude obtained by the balloon in which they were seated. M. Tissandier shares, we believe, with Mr. Glaisher the honour of having reached the highest point above the earth ever attained by man, although it is but fair to state that Mr. Glaisher has precedence, having made his voyage some ten years before M. Tissandier. In the accident at Paris last week the balloon, which was under the command of M. Tissandier and M. Godard, contained a large staff of military and naval men, all of whom were badly hurt, with the exception of M. Tissandier, who escaped serious injury by hanging on to the ropes dangling above the car. One of the officer's names is given as Colonel Lassédet, but we should not be surprised to hear it is the gentleman well known in photographic literature as the Commandant Laussedat, whose name has been frequently mentioned in these columns. He was, as our readers may remember, in the Ordnance Survey Office at Paris, where he developed a sound and practical method of photo-lithography for use in copying and printing military maps and plans. We know M. Tissandier has given some attention to balloon photography, and it may have been to ascertain how such a process is really practicable in the field that the French officers made the ascent. We are glad to hear that no lives were lost upon the occasion, but several of the officers, and M. Godard in particular, appear to have suffered severely.

A New Sensitive Photometer.—A communication which cannot fail to be of interest to photographers has just been made to the Berlin Academy of Sciences by M. W. Siemens, on the subject of a new and very sensitive photometer. Great difficulty prevails, as every experimental photographer knows, in instituting comparison between the light at

different times of the day and from different sources, and it will be in controlling experiments connected with this subject that M. Siemens' instrument may be of value to the photographic investigator. Light, it appears, acts upon selenium in such a manner that it interferes more or less with its power of conducting electricity. This circumstance, which was first pointed out by Willoughby Smith and Sale, M. Siemens makes use of in the construction of his photometer. A new crystalline form of selenium, which is obtained by heating the substance continuously to a temperature of 210° Cent., is found to be a very good conductor of electricity indeed, and, moreover, greatly affected by light; so much so, in fact, that if two wires, one millimetre apart, are fused between two leaves of mica into this crystalline selenium, the most marked results are obtained, according to the intensity of the light at the time of the experiment. M. Siemens tells us that dark heat rays do not in any way influence the conductivity of the material. Diffuse daylight, allowed to act upon the selenium, at once doubles its conductivity, so that the needle of a galvanometer would indicate in a very marked degree the accession of light, while, if sunlight is admitted to act upon the selenium photometer, the conductivity is increased to ten times the amount. Photographers will see at once, therefore, the value of an instrument so delicate as this: If, for instance, we set down, for the sake of example, the conductivity of this selenium in darkness as represented by the number 100, on the admission of sunlight we should find a galvanometer specially graduated for the purpose marking as much as 1000°. On shutting off the light the conductivity diminishes apparently at once, so that on the illumination waning to any extent, the experimenter would be informed of the circumstance in a moment. It is true, M. Siemens informs us, that when absolute darkness again intervenes, a little time elapses before the selenium returns again to its normal condition, but this, to photographers at any rate, would be of little consequence, since it is rare indeed that they have to work in perfect obscurity.

Successful Photographers.—Although, perhaps, it is too much to say that the surest way to become Lord Mayor now-a-days is to take up the profession of photography, still it cannot be denied that by so doing there is at any rate a chance one day of becoming Alderman, as witness two very recent instances, those of Mr. Alderman Mayall, of Brighton, and Mr. Alderman Nottage, of London. Last week Mr. Alderman Nottage celebrated his installation as one of the magistrates and chief officers of the City of London by a grand banquet, and we were glad to see among the guests several gentlemen whose names are well known in photographic art and science. On an occasion like this, when there must have been friends and public men innumerable to be invited, it was a pleasing reflection to think that Mr. Nottage had not forgotten, in the days of his prosperity, to welcome some of those who had laboured with him in the field where he has reaped so rich a harvest. It is the custom, we know, for most photographers to cry out about the unprofitable character of their profession; but, somehow or other, when one comes to inquire into circumstances, there are few first-class men, either in this country or abroad, who have not done well in their way. Some years ago we remember a gentleman remarked to us on the bad prospects of the art, and said that it was impossible to point to half a dozen men who had made ten thousand pounds by photography; and on our repeating this conversation to another friend, this latter assured me at once that the former had undoubtedly amassed that sum, or more, himself. And it is certainly true, as many will bear out, that there are at present in this country a good many gentlemen who have followed photography as a profession with very good results to themselves, and we, personally, could, without hesitation, name a dozen such gentlemen who have earned fortunes, big and little, by means of the camera. On the Continent it is the same. Firms like those of Reutlinger, Walery, and Liebert, of Paris; Loescher and Petsch, and Hanfstaengel,

f Berlin; Fritz Luckhardt and Adele, of Vienna; Braun, of Dornach; Bergamasco, of St. Petersburg; the late Ghemar Freres, of Brussels, and many more, have amassed more money than we should like to specify. But it is the privilege of Britons to growl, and photographers are no exception to the rule; what our neighbours say of us is very true: "Englishmen are never satisfied unless they are grumbling."

A NEW METHOD OF IMPARTING ARTISTIC FINISH TO PHOTOGRAPHS.

BY EDWARD DUNMORE.*

THE subject I have selected to bring before you this evening, I believe, is somewhat new. But as to any absolute novelty in the photographic world, is there such a thing? I doubt it. Any way, the plan I now have the pleasure of submitting for your approval possesses the qualifications of simplicity and inexpensiveness, combined with the power of imparting an artistic appearance to certain classes of photographs, and, to the best of my belief, has, to the present time, escaped general observation. It consists in a recommendation to sandpaper your mounted and enamelled proofs, not for the purpose to which sandpaper is generally applied, but to produce roughness. The materials are few, and their application easy; they consist of sandpaper of various degrees of fineness—cardboard and glue, that is all. Use them after this fashion. Cut a piece of cardboard somewhat larger than the mounted proof, upon which glue sandpaper, face up, and when dry, cut out an aperture corresponding exactly in shape and size with the picture to be operated upon; make the edges of the aperture smooth and even. This constitutes the mask or die. Suppose it is a medallion portrait of the usual C.D.V. size you wish to finish: fit the sandpaper mask, face down, on the enamelled side of the portrait, adjusting it so that the oval picture corresponds with the aperture of the mask. Place a piece of smooth paper outside for the purpose of printing, scratch on the polished parts, and the whole to be passed through an ordinary rolling press, face down. On removal it will be found roughened on those parts that have been in contact with the sandpaper, and the polish and relief of the smooth portions greatly enhanced by the contact. Various degrees of fineness may be obtained by slightly shifting the position of the mask, and putting through the press after each alteration. This is the novelty. Other substances than sandpaper can be used. Probably an engraved metal plate would be better; in fact, almost any textile fabric, such as net, gauze, lace, &c., are applicable. For my own part, I prefer the effect of sandpaper to a more ornamental design; a flat matt surface being good as anything, if not better, for giving value to the polished part.

My plan was published in the *British Journal* of last week. Possibly some gentleman present has given it a trial. If not, I should advise him to do so.

DEVELOPER FOR FIELD USE.

BY DR. C. W. BINGLEY.†

PREPARE a quantity of a saturated solution of protosulphate of iron; to each pint of the solution add a drachm of sulphate of iron; from this stock solution filter out what you may require when going out. This solution will contain about 160 grains to the ounce of the proto. To dilute this to any degree of strength, take out a solution of acetic acid containing $1\frac{1}{2}$ ounces of the acid to 18 ounces of water. Also take a 2-ounce nitrate of silver bottle (which, by the way, makes an excellent developing cup to pour the developer over your negative), gum a narrow slip of paper up the side of the bottle, and with a pair of compasses and a scale divide it into eight equal parts, and with a file mark out the divisions on the glass. You thus obtain a graduated

developing cup, ready at hand to dilute and prepare your developer—each division corresponding to 1 fluid drachm of 60 minims or drops—though the exact quantity each division may contain is immaterial so long as the relative portion of each is maintained.

One measure of the iron solution with the bottle filled to the eighth division makes a developer of 20 grains to the ounce of iron; filled to $6\frac{1}{2}$, a 30-grain solution; and to the eighth, with two divisions of the stock solution, a 40-grain solution.

Of course, if alcohol, glycerine, &c., is desired to be added, it can be done by adding it to the diluting solution.

ACTION OF COLOURED SUBSTANCES UPON THE SENSITIVENESS TO LIGHT OF BROMIDE OF SILVER.

BY PROF. H. VOGEL.*

Two years have now elapsed since I proved that it was possible to render chloride and bromide of silver sensitive to the red and yellow portions of the spectrum, and to heighten the action of these colours upon a sensitive film. Very shortly after the publication of my remarks, Mr. Carey Lea stood forward to combat my theory, seeking to strengthen his remarks by detailing some unsuccessful results which he had obtained. To him subsequently were joined Dr. Van Monckhoven and Mr. Spiller; and only M. Becquerel, of Paris, secured results favourable to my theory and confirmed my statements. Nevertheless, Mr. Lea, Mr. Stillman, and several others maintained an opposite view to me, and were pleased to enter into many arguments upon the subject. It is with much pleasure therefore, that I am enabled to put forward a letter just received from my comrade in the recent expedition to the Nicobar Islands, Captain Waterhouse, who has repeated my experiment in a most exhaustive manner, and has employed in his investigations a very large number of colouring matters, so that we have now a goodly mass of data in hand. Waterhouse worked under much more favourable circumstances than I. Under a tropical sun, and in the clear atmosphere of India, such experiments can be conducted far better than in our dull northern climate.

Captain Waterhouse writes:—"There cannot be a doubt that colour exerts a powerful influence upon the sensitiveness of bromide of silver, and that different colours give different results in regard to the sensitiveness of different portions of the spectrum. I shall publish my investigations at length, but in the meantime may mention the following results as having been obtained.

"A pure bromide of silver collodion film is at least as sensitive to red rays as any other colour, at any rate in respect to the extension of its action toward red, although not in its intensity.

"Naphthaline red increases the sensitiveness for yellow, but diminishes the sensitiveness for green and red.

"Violet and purple increase the sensitiveness for yellow and orange, but diminish it for green.

"Chlorophyll increases the sensitiveness for red, and gives a marked band, which appears deeper in the spectrum than that between B C, as mentioned by Becquerel.

"A red dye of Judson's, which smells very strong of turmeric, gives great sensitiveness for yellow, less for green, and increases in a material degree the sensitiveness for red.

Roseine (aniline red) gives material sensitiveness for yellow, is slightly sensitive for green, and insensitive as regards red. I have, however, obtained an opposite action in red, at least so far as it is concerned.

"Coralline appears to make red sensitive, but this requires further proof.

"Blue gives sensitiveness for blue, but very little in green and orange.

"In nearly every case the spectrum becomes reversed in the

* Read before the South London Photographic Society.
† *Western Photographic News*.

* *Photographische Mittheilungen*.

blue portion—that is, instead of light lines in the negative, dark ones appear on development, the same beginning at G, and stretching as far as H and I; they appear, with different preparations of a different character, sometimes lighter, sometimes darker, but this seems to be only the result of over-exposure."

These results confirm, except as regards the doubtful action of blue and coralline, in the highest degree my previous investigations.

I also observed in the case of naphthaline red and roseine a diminution of sensitiveness in the green, and that the sensitiveness brought about by the colours rose and fell with the refraction index. Moreover, I found that the maximum of photographic action did not tally exactly with the spot of absorption band of the added colour, but extended towards the red. In this Captain Waterhouse confirms me most completely in the case of chlorophyll. Positive lines, instead of negative ones, I have also obtained frequently.

Captain Waterhouse has not tested the absorption spectra of the different colours. It would be well worth while to do so, as, generally speaking, the colouring matter exerts its photographic action at that point. That aniline blue is an exception to this rule I have already pointed out at the beginning of the present year in the Transactions of the German Chemical Society; also the circumstance that several colouring substances increase the sensitiveness of the photographic film at one point, and diminish it at another, I have had occasion to point out.

ENLARGEMENTS WITHOUT APPARATUS.

BY DR. LINSEKANG.*

In the studios of Paris and Brussels there are to be found enlarged portraits executed in black chalk, in a most careful manner, which are remarkable for their clearness and artistic value. For the most part, these portraits are said to be enlargements from cartes-de-visite. Their beauty and excellence caused me to make enquiry about their producer, in order to obtain some knowledge of the manner in which the pictures were obtained; but I could find nobody who could, or would, give me the information I desired, until at last, by chance, I made the acquaintance of the gentleman himself whose productions they were.

His studio was at the top of a high house in one of the narrow unfrequented streets of Paris. In his atelier were all sorts of things to be found: rare plants, foreign birds in large cages, studies of all kinds, and a large collection of pictures, but not a single stick of photographic apparatus.

The secret was out, however, as soon as I saw the artist at work. Upon his easel stood a picture which he had just commenced, and I was in a position to follow the progress of the work, as the vivacious little gentleman was in no way disturbed by my entrance and conversation. Before him stood a carte-de-visite fixed upright, and this he examined through a magnifier with the left eye, while with the right he sketched the outlines of the portrait upon a sheet of cardboard. I had therefore, as was apparent, to do with no photographic process at all, but simply with an artist who sketched from a carte as he saw it enlarged before him. Most interesting was the way in which he applied a little black chalk to his sketch, and rubbing it with his finger produced a light half tone, corresponding to that in the print. The finished result was so much like a photograph that experienced operators were exceedingly astonished when I explained to them the actual manner of production.

We have therefore got so far, apparently, as to dispense altogether with photographic apparatus, and to do the work by means of the pencil. That the public is satisfied with the pictures may be deduced from the high prices charged by the artist, who asks 250 to 300 francs for his productions in Paris, and 400 to 500 francs from foreigners.

* Photographische Archiv.

The work, too, is rapidly got through, for in two or three days a picture is finished, or sooner, even, under some circumstances.

Enlarged sketches of similar character we have seen produced by M. E. Selibach of Antwerp, who does not, however, ask such high prices for his enlargements. This gentleman also employs a means of retouching his negatives that is worthy of note. His clichés are not varnished, but covered with gum-solution, and those parts which it is desired to make more opaque are evenly polished with diagonally cut pieces of wood. By thus pressing upon the precipitated silver, the latter becomes denser and more opaque. Retouching in this way is said to be a much quicker operation than with graphite. So far as our experiments have gone, we have not been able to secure any good results in this way; perhaps, however, in the case of intensified negatives it would have been different, for our trials were confined to clichés which had simply been developed.

TRANSPARENCIES BY THE COFFEE PROCESS.

BY THOMAS HINE.*

AFTER cleaning the plates, the preliminary coating is applied. One part of albumen well beaten, and then allowed to stand, is, after decanting, mixed with twenty-five or thirty parts of water, a few drops of ammonia being subsequently added.

The plate, having been coated with collodion, is immersed in an eight per cent. silver bath freely acidified with pure nitric acid, and allowed to remain therein for four or five minutes. It is then removed, and, having been well drained, is placed in a bath of pure water, while a second plate is put into the sensitizing solution. The first is then carefully washed under a tap covered up with a small linen bag to serve as filter; when the plate is freed from all appearance of greasiness the washing operation may be considered to have gone far enough, and it is placed in a second bath containing water, where it can remain until the time arrives to drain it and apply the preservative solution to its surface.

The preservative solution consists of a combination of coffee and gum:—

No. 1.			
Boiling distilled water ...	...	...	5½ ounces.
Mocha coffee ...	...	...	1 ounce.
White sugar ...	...	...	90 grains.
No. 2.			
Distilled water ..	...	...	5½ ounces.
Gum-arabic ...	...	...	90 grains.
Sugar-candy ...	...	...	20 grains.

The coffee extract is allowed to cool in a well-corked bottle, and both liquids are then filtered and mixed, forming together a clear brown liquid, which will remain in good condition for several days. The quantity destined for each plate should be filtered and poured on like collodion; a second application of the liquid is made to the same plate, care being taken to prevent the formation of bubbles, and the solution should not then be further used. The coated plate is placed on end upon a sheet of filter paper to drain before being put into the drying closet.

Dry plates prepared by the coffee gum method require an exposure of but three times that necessary for the wet process, with the same lens and the same light.

The exposed plate, having been covered with water, or immersed for three or four minutes in a bath of that liquid, is drained, and placed in a horizontal position; over it is then poured sufficient distilled water to cover the plate, to which six to ten drops of a saturated solution of carbonate of ammonia have been added. This liquid commences development; for, if sufficiently exposed, the sky and high lights begin forthwith to appear. As soon as the solution

* Read before the Chicago Photographic Association.

of ammonia ceases to act, it is poured back into the developing glass, and a few drops of pyrogallie acid dissolved in alcohol are added. This pyrogallie solution is prepared by simply dissolving ninety grains of pyrogallie acid in one ounce of alcohol.

The image now fully appears, but it is seen only by reflected light, and is scarcely visible when the plate is viewed as a transparency. Nevertheless, the action of the solution continues until every possible detail in the shadows has been brought out. Wash, and apply the following solution:—

Water	...	...	...	...	4 ounces.
Ammonia-sulphate of iron	...	...	...	...	45 grains.
Sulphate of copper	...	...	...	...	45 grains.
Citric acid	...	...	...	...	45 grains.

This is poured upon the well-washed plate, and sometimes produces by itself sufficient action. Generally, however, it is necessary to complete its action by adding a little silver, when details will at once appear, which otherwise would never have been brought to light; and it is, indeed, but very rarely that with the aid of this solution a satisfactory result is not attained, even in very unpromising instances. If necessary, intensify further with pyro and silver. Fix with hypo.

SILVERING GLASS.

MR. D. C. CHAPMAN, writing to the *Scientific American*, says:

"Having had occasion to silver some small plates of glass, I tried several formulas. In some I found the silver solution so weak that it required repeated applications to give an opaque deposit. In others the silver was so strong that there appeared to be a waste. After trying several modifications I found that the following works very finely, giving a heavy deposit by a single application:

"No. 1. Reducing solution: In twelve ounces of water dissolve twelve grains Rochelle salts and boil. Add, while boiling, sixteen grains nitrate of silver dissolved in one ounce water, and continue the boiling for ten minutes more, then add water to make twelve ounces.

"No. 2. Silvering solution: Dissolve one ounce nitrate of silver in ten ounces water; then add *liquor ammoniac* until the brown precipitate is nearly but not quite all dissolved; then add one ounce alcohol and sufficient water to make twelve ounces.

"To silver: Take equal parts of Nos. 1 and 2, mix thoroughly, and lay the glass, face down, on the top of the mixture while wet, after it has been carefully cleaned with soda and well rinsed with clean water.

"Distilled water should be used for making the solutions. About two drachms of each will silver a plate two inches square. The dish in which the silvering is done should be only a little larger than the plate. The solutions should stand and settle for two or three days before being used, and will keep good a long time."

HOW MANY SITTINGS SHALL THE PHOTOGRAPHER GIVE?

REGARDING the Brooklyn case of refusal to accept portraits, pay for them, or sit again, the judge's decision with regard to which is not yet reported, the *New York Times* says:—

"A Brooklyn photographer lately appeared in court bearing with him seventeen separate negatives, each purporting to be the portrait of one and the same young lady. She had come to his operating room and desired to be photographed. The photographer applauded her design, and promised to do full justice to her charming features. He placed her in his chair; inserted the prongs of the 'head-rest' in her back hair; requested her to contemplate with rapturous admiration the optical bait which photographers pin upon the wall to catch the eyes of their patients, and

then uncorked his camera. Whether the young lady smiled too soon, and thus impressed upon her negative a series of concentric but entirely useless mouths, or whether she suddenly thought of a hated rival, and was thus betrayed into an unintentional wriggle, whereby the negative was made to bear the image of a broad but nebulous maiden with features drawn out into horizontal lines, and with expansive hands furnished with dozens of faint and fat fingers, we are not told. When, however, the photographer emerged from the dark closet wherein he had poured out libations of nitrate of silver to the sun-god, he brought with him a picture which was found 'unsatisfactory,' and was compelled to offer to take a new one which should be more like the sitter, and less like a view of the nebula in Orion. Seventeen successive attempts did this patient photographer make to fix the features of his fair visitor upon the sensitive plate. Each time the result was alleged to be a failure. There was too little nose in one picture. In another an excess of nose belittled the other features by contrast. In this one the eyes were lacking in expression; in that the mouth was out of drawing. Many of the pictures failed to do justice to the lady's chin, while others wore an air of hopeless resignation to the photographer's experiments which would have drawn a smile of derision from the severest of Cheshire cats. At least we may suppose that such were the complaints made by the young lady as she rejected each successive picture. When the seventeenth had been submitted and rejected, the long-suffering photographer declined to spend the rest of his life and chemicals upon so difficult a subject, and went to law to obtain some compensation for his wasted time and capital.

"The decision in this case will be of much interest to persons about to be photographed. That process at present not unfrequently results only in vexation of spirit. If a satisfactory likeness is not obtained after two or three trials, the sufferer, uncertain of the law, and unwilling to incur the further scorn of the photographer as a person wholly devoid both of good taste and ordinary eyesight, consents to accept the least objectionable negative, and thus becomes the possessor of a collection of photographs capable of giving pleasure to the owner's bitterest enemy, and utterly unavailable for any other purpose. Should it be decided in the Brooklyn case that a photographer who has once undertaken to produce a satisfactory portrait can be compelled to make good his promise, even if it takes a hundred sittings, the path of his patrons will be plain. No man or woman will henceforth be compelled to hide in secret drawers, or to commit to midnight ash-barrels, photographs which are a misery to the owner, and which cannot be given away, except with a view of insulting the recipient. But, on the other hand, the decision which should thus protect the public might work serious injury to the photographers.

"A malicious photographer might ruin a rival by perpetually sitting for his picture, and perpetually rejecting the negative with sarcastic comments. To take thousands of photographs for one man, and to receive in payment nothing but gibes and insults, would break the spirit and exhaust the pocket of any 'artist.' The law can hardly be so negligent as to leave room for such a possibility; and yet to fix upon a definite number of sittings as a limit to which the unskilful photographer can be compelled to go would be arbitrary and unsatisfactory to all parties. Of course, we need not apprehend that the court will decide that the public is wholly at the mercy of the photographer, and that it is entitled to but one negative for its money. In that case he who should enter a photograph gallery would leave all hope behind. For him the staring eyeballs, the excessive nose, and the agonised mouth which the unskilful operator so invariably produces, would be served up in place of a truthful portrait, and the money would be remorselessly exacted, while the victim would be forced to remove his pictures from the premises with, perhaps, the sarcastic advice to send them to his wife's relations. No court, however, will lend itself to such an outrage, and we can await the decision

of the Brooklyn court with reasonable confidence that it will promote the cause of justice by doing away with the uncertainty which now characterises the relations between the photographer and the public."

HOW TO LAY WATER-COLOURS ON GLASS.

BY DR. C. W. BINGLEY.*

MAKE a thin size with light-coloured glue, strain through muslin, and with this mix the water colours on a plate, and lay on as warm as possible with a camel-hair pencil. If the whole of the back of a negative has to be coloured—as, for instance, to improve a weak and flat negative by the "blue paint dodge"—the sized colour can be best evenly applied with a flat camel-hair brush. If care be taken not to get the size too thick, and to lay the colour on warm, a perfectly smooth and even surface is obtained on drying, not liable to be rubbed off on printing, nor subject to cracking, as is the case if gum-arabic be used.

By making the glue in a clean white jar with a lid on rather thicker than required for use, and adding about a drachm of carbolic acid to it before it sets, on cooling a stock solution may be kept on hand for any length of time, only requiring then to take out a small portion to dilute with hot water for use as required.

THE RELATION BETWEEN SPECTRAL LINES AND ATOMIC WEIGHTS.

MR. E. VOGL, writing to the *Scientific American* from San Francisco, draws attention to some curious relations between the absorption lines in the solar spectrum and the atomic weights of bodies the light from the combustion of which gives analogous lines. He says:—

The following facts, disclosing an intimate connection between the Fraunhofer lines of the solar spectrum and the atomic weights of the substances whose glowing vapours they represent, will, if confirmed, prove of the highest importance and interest. Being desirous, on this account, of bringing them at once to general knowledge, I send you the following condensed statement, which I hope you will publish.

The Fraunhofer lines of hydrogen gas are, according to Angström's wonderfully accurate measurements (given in millimeters, a millimeter being 0.3937 of an inch):—

0.00041012mm.
0.00043490mm.
0.00048606mm.
0.00065618mm.

Their distances from the shortest wave lengths are consequently:—

43400—41012=0.0002388mm.
48606—41012=0.0007594mm.
65618—41012=0.0024606mm.

Referring these distances to 0.00041012, the shortest wave length, as a common standard of value, the figures obtained are:—

0.00041012: 0.0002388=17.1742
0.00041012: 0.0007594=5.7247 × 3=17.1741
0.00041012: 0.0024606=1.9082 × 8=5.7246

being to each other as 1—3—9. Supposing the quantity expressed by 1.0982mm. to represent three units of a certain measure of length, the distances of the H lines increase as the squares of 3:3—9—27.

The H molecules of the solar atmosphere which give rise to these lines consist of ponderable matter; and (the mechanical force of the luminous impulses having been so recently demonstrated by Professor Stokes) the inference is that refraction, the angles of which are measured and expressed by the wave lengths, is the function of the energy

proper to the different constituent particles of the luminous molecules: that these particles are held together by attraction, the common property of matter, decreasing inversely as the squares of distances.

On this supposition, the attractive forces of the H molecule proceed from a centre where they are at their maximum; and the distances between the different constituents being known, the value of their attractive energy can be calculated from the constant relation between attraction and distance. To the distances 3—9—27 correspond the respective forces $\frac{1}{3}$ — $\frac{1}{9}$ — $\frac{1}{27}$; and a unit of force, by which the values of attraction of all solar substances can be measured and compared, is represented by the length of shortest waves. In dividing the atomic weights of the substances whose spectral lines are known by the length of their shortest waves, and converting the result into chemical weight by taking the quotient obtained for H=1, the values are as follows:—

Atomic weight.	Shortest wave length.	Divided by 2438.
H = 1.00	0.00041012=	2438=1
Ca = 40	0.00039380=	101704=41.72
Fe = 56	0.00039380=	142385=58.4
Al = 27.3	0.00039428=	69240=28.4
Mn = 55	0.00039882=	137907=56.6
Ti = 48	0.00041681=	115299=47.3
Cr = 52	0.00042582=	123261=50.15
Ni = 58	0.00044020=	131758=54
Mg = 24	0.00044805=	58565=22
Ba = 137	0.00045241=	302828=124.21
Co = 59	0.00045803=	160284=65.4
Cu = 63.4	0.00046510=	136315=56
Zn = 65	0.00046790=	138919=57
Na = 23	0.00049825=	46137=18.9

Notwithstanding the differences, the figures of the last column so closely correspond to the atomic weights that the inference of a near relationship between the spectral lines and atomic weights seems irresistible. When the extreme faintness of the lines in the portion of the spectrum of the greatest refraction is taken into account, some of the difference may not unreasonably be attributed to the existence of shorter waves than those quoted. The definite proportions between differences and atomic weights point to this. Thus 18.9 is nearly $\frac{1}{2}$ of 23; the line corresponding to the atomic weight of 23 is 0.00040900: if this line, which really exists, should prove to belong to Na, the test would be decisive. The importance of the conclusions to be derived from the existence of such relations is apparent. The evidence of atomic molecules, when brought within the reach of scientific investigation, and their dependence on the general law of gravitation, would disclose the inner constitution of matter, the nature of chemical affinity and valency, and the nature of electricity and magnetism; and it would be instrumental in the solution of many problems.

ELECTROPLATING WITH NICKEL.—In Plazanet's process a bath is used of 87.5 parts sulphate of nickel, 20 sulphate of ammonia, 17 citric acid, and 1,850 of water. A bath much used in France is formed of a solution of 4 parts of nitrate of nickel in 4 of liquid ammonia, and 150 water in which 50 parts of sulphate of soda have been dissolved. Using a moderate weak current the operation is at an end in a few minutes. There is no need to interrupt it by taking the objects out and brushing them. When the film of nickel is of sufficient thickness, the objects are withdrawn from the bath, and dried with sawdust.—*Scientific American*.

PRESERVING PLATES MOIST.—Mr. St. Clair says:—"Coat your plate in the usual way, and then take one drachm of glycerine to nine drachms of the nitrate of silver bath solution, or whatever strength you use it. Of the nitrate bath solution nine drachms of that and one drachm of glycerine. Mix the two intimately together, and, after your plate comes from the bath, coat it with this; pour it off; give it a second coating, so that it runs perfectly clear with all the lines. Your plate will keep for twenty months."

* *Western Photographic News*

The Photographic News.

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WORKING AN ALKALINE NEGATIVE BATH.

ALL the native ills to which the negative bath is subject seem to become intensified in winter, especially in the earliest weeks of cold weather, and, added to these, are generally many more belonging to other causes, which are attributed to the bath. The plates are imperfectly cleaned, or are coated whilst they are damp, and the negative is stained, has markings of various abnormal kinds, is fogged in parts, the film splits in drying, and forthwith the conclusion is obtained that the bath is out of order. We might go on multiplying the list of evils of which the bath is the scapegoat, but, as the actual evils are serious enough in the present state of the weather, we will confine ourselves to calling attention to one perpetually recurring trouble, and a somewhat novel remedy.

Mr. Frank E. Eliot, one of the most experienced and observant of living collodion workers, called the attention of photographers in our last YEAR-BOOK to certain advantages to be derived from working the negative bath, not in a neutral condition as recommended by some, nor in an acid condition as approved by others, but in an absolutely alkaline condition. Before the minds of most workers visions of fog are at once conjured up, and a variety of other horrors, as the inevitable *sequels* of such a bath. But to remove these visions of horror, it is to be remembered that, whilst the bath was to be acid, the excited film was not so. A collodion containing sufficient free iodine was to be used, the result of which was the liberation of a sufficient trace of nitric acid on and in the film to prevent fog. And in the next place it was to be remembered that this announcement contained not simply a theoretical proposition, but a record of successful practice from an eminent practical man. To the record then given we have now added the results of another year's experience, with many more interesting details. Mr. Eliot has favoured us, for our forthcoming YEAR-BOOK, with the further record of the past year's working, which has fully confirmed his conviction of the advantages of this novel bath; and to one or two points of especial interest we think it desirable to call the attention of our readers at once, referring them to the YEAR-BOOK itself, which will shortly be ready, for fuller particulars.

One especial point of importance in connection with this nitrate bath is the fact that it contains no iodide of silver and hence there is perfect immunity from the pinhole

which are the frequent result of supersaturation with iodide of silver, or the double salt it forms. There is no iodide added to the bath, and in Mr. Eliot's experience there is none formed. This latter proposition, which at first sight seems startling, is accounted for by the fact that the nitrate solution is kept saturated with carbonate of silver to preserve the alkaline condition, and, thus saturated, it is no longer capable of dissolving any iodide of silver. Either iodide of silver or carbonate of silver is soluble to a limited degree in a solution of nitrate of silver, but in Mr. Eliot's experience not both together; and if as much carbonate of silver is added as the nitrate solution will take up, it no longer possesses any capacity for dissolving iodide of silver. Hence, a serious train of troubles is eliminated from the bath at one fell swoop. Some other valuable advantages are gained, amongst which increased sensitiveness is of no mean importance. And there are other interesting details into which we cannot enter at present.

The use of an alkaline bath has been suggested before, but never, so far as we can remember, with such a clear and logical statement of the *rationale* of its working as Mr. Eliot now presents to photographers. Mr. McLachlan, some time ago, in a paper read before the Photographic Society, recommended the use of alkaline conditions, and narrated some interesting details of the advantages he had found in his own practice. Unfortunately, his theory was mixed up with some notions of an occult influence exercised by sunlight on dry nitrate of silver, months of exposure to this influence being necessary to prepare the silver salt for use in the alkaline bath. From this and some other causes the method indicated did not receive the amount of attention it probably deserved, and which, at any rate, the enthusiastic earnestness of its propounder might have demanded, and the matter passed out of notice. Mr. Eliot's simple statement of facts will probably command attention and interested readers, and bring forth fruit.

A MATT MARGIN TO ENAMELLED MEDALLION PHOTOGRAPHS.

EVERY form of novelty in connection with his art is of interest, and may prove of profit, to the professional portraitist. In a business point of view, it is insufficient to be ready to supply what the public absolutely require or ask for. It is often as important to be able to create new wants as to be able to supply those which exist and are felt. There is nothing beneath the dignity of art in this. The greatest artists of the day, every painter, every sculptor, every engraver, who sends his work to the Royal Academy and other exhibitions, embarks on this enterprise. He produces a fine picture, a fine piece of statuary, a fine proof, and he exhibits to create a want, if possible, and to sell his work to the customer in whom this want is created. We make this remark in passing because we have heard some, with a keen desire to uphold the status of the photographic profession, express a notion that it was beneath the dignity of art to endeavour to reduce the public into giving additional orders by the display of new styles and varied attractions, having a notion that the true artist should be content to execute, in the most artistic fashion in which he is able, the absolute requirements of the public, without offering attractions like a fancy shopkeeper.

This much by way of prelude to a notice of an interesting little novelty recently brought by Mr. Dunmore before the South London Photographic Society. The idea admits of varied modification and extension, but the form in which it was presented consisted of a card oval-medallion portrait, enamelled with collodion and gelatine in the manner familiar to our readers, but with the margin round the oval graduated or roughened in surface, which gave an effect of increased delicacy and finish to the portrait and its oval medallion. The mode in which this effect is produced is very simple. In the examples exhibited the effect was produced by pressure in contact with a card having a roughened oval aperture.

once that these shapes or masks could be of grained metal or plates bearing diaper or other patterns, or of shagreen or rough cardboard or canvas, or a variety of materials, which by contrast might give delicacy to the medallion bearing the portrait.

Some years ago a fashion was introduced in America of giving a frame of rough drawing-paper or canvas to the whole picture, and we have seen some good effects so produced; but there were in some cases disadvantages which prevented the plan becoming common, many persons objecting to the coarse obliteration of definition that occasionally occurred in an important part of the picture. In Mr. Dunmore's method this objection, of course, has no weight, as the gradation of the picture is preserved in all its actual delicacy, and enhanced by the contrast of a granular, although not perfectly matt, margin.

PRECIPITATING SILVER FROM OLD FIXING BATHS.

There is no task which, as a rule, the photographer undertakes with greater repugnance than the precipitation, by means of sulphide of potassium, of the silver contained in his old fixing baths of hyposulphite of soda. The unpleasantness of the stench, the injurious effects of the fumes in the operating-room, and a degree of uncertainty to the non-expert, all tend to render the task an irksome one, which many small photographers shirk, throwing away the silver rather than encounter all its offensive possibilities, and thus, according to the calculation of some, an average of 30 per cent. of the silver employed in the printing bath is deliberately thrown into the gutter.

Referring to our recent remarks on Dr. Vogel's promised discovery for simplifying this matter, the editor of *Anthony's Bulletin* says:—

"A great deal has been written upon the above subject, and it is surprising that photographers continue to throw away their hypo. solutions when the recovery of the silver is so easy and the return so valuable. We use our hypo. about 1 in 8, run off the solution into barrels, and treat it with sulphuret of potassium. When the solution of sulphuret is added to the hypo. solution, the sulphuretted hydrogen, which smells so badly, combines immediately with the silver, and sulphide of silver is precipitated. So long as a trace of uncombined silver exists in the hypo. solution no smell will proceed from it; and it is the easiest thing in the world to tell when enough sulphuret has been added, as the moment all the silver has been converted into sulphide the smell of the sulphuret will be found proceeding from the hypo. solution. To stop this, all that is necessary is to have a very small quantity of the hypo. solution reserved, which should now be poured back and stirred through the solution. This will arrest the escape of the sulphuretted hydrogen. Thus all smell will be avoided, except that which comes from the sulphuret solution in pouring it into the hypo., and even this could be avoided by using a properly-prepared vessel for holding the sulphuret solution. Have a vessel made open at both ends; cork one end, and at the other introduce the water and the sulphuret, and cork it. When solution is effected, uncork one end and invert the vessel, and plunge the end into the hypo. solution; then pull out the cork of the upper end, and the sulphuret solution will descend into the other without a trace of smell."

PRACTICAL NOTES ON VARIOUS SUBJECTS.

BY CHARLES WALDACK.

Ghent, December 10th, 1875.

The Silver Solution for the Collodion Process.—So much has been written on this subject that it ought to be exhausted, and I feel almost like apologising to the reader for referring to it again. What I have to say about it is

certainly not new, although I think it has some value. The glass on which the negative is made is but very seldom chemically clean, and a proof of it lies in the deposit which, with certain collodion, and under certain circumstances, is formed between the film and glass during development, also in the deposit formed on the back of the plate. This is a permanent cause of the introduction of organic matter into the bath. Another cause lies in the use of albumenized glass. A third one resides in the collodion itself. A fourth is caused by atmospheric dust. One way and another, organic matter is introduced, and, after a certain time, the bath works foggy. The remedies are simple enough—neutralizing and sunning, or boiling. But this latter takes time which the photographer has not always to lose, for his solution may begin to look foggy in the midst of the day's work. The remedy I now propose to give acts constantly, and no time is lost save that necessary to filter the solution, and this, in the case of a flowing bath being used, which requires but a relatively small quantity of fluid, is the work of a few minutes. The remedy is based on the property of a precipitate to absorb and carry down organic matter. Any photographer may have observed that when a bath is made with water of doubtful purity, the precipitate of iodide of silver which is formed on the addition of iodide of potassium, instead of being of a fine yellow, is greyish. This is owing to the presence of organic matter. For this purpose, however, I do not propose to use iodide of silver for obvious reasons, but chloride, precipitated by means of salt or chloride of ammonia. A quantity of chloride in solution is added, sufficient to produce an abundant precipitate. A few crystals of nitrate of silver can be added to make up for the loss. The liquid is well shaken, and then the larger part of the chloride of silver is allowed to deposit, which takes but a very short time; after which the clear part is filtered. The solution can be added every night to the precipitate, and every morning the clear bath can be drawn off. After a time, the chloride of silver will have absorbed as much organic matter as it can, when it is filtered out and added to the waste. This is about the simplest way I know of to keep a bath in good working order, and one I can safely recommend, having given it a trial of several months. Of course, the alcohol which accumulates in the bath is to be removed, in the ordinary way, by boiling.

A few years ago it was recommended to doctor a foggy bath by adding cyanide of potassium, and in the hands of many this addition proved very effectual; but it has the disadvantage of depriving the bath of its acid, whereas the addition of chloride leaves it as it is.

Stains Between the Film and Glass.—Above I referred to the almost impossibility of getting a plate chemically clean. In developing a properly exposed negative, the metallic silver is carried with such energy to the insulated parts that none is deposited between the film and glass, even if the plate is not clean. An under-exposed negative, however, is very apt to have such a deposit in the shadows, and on drying the film will split and peel off. The same effect is produced when collodion is used containing cadmium salts, although a full exposure may be given. Such collodion should be allowed to ripen, and this takes more or less long, according to the greater or less quantity of the cadmium compound used. Sufficient tincture of iodine can also be added to give a lemon colour to the collodion, in which case it can be used immediately; and this addition can be made without any fear of interfering with the sensitiveness.

The Use of the Burnisher.—One of the great objections against the use of hot burnishers to give an extra gloss to prints on albumen paper is that the retouching, if done in ink, is liable to come off. This defect presents itself principally when double or strongly albumenized paper is used, and when the retouching is done with gum mixed with the ink. A simple remedy is to add a small quantity of wax to the alcohol solution of soap with which the photographs are rubbed before being burnished. The quality, I suppose,

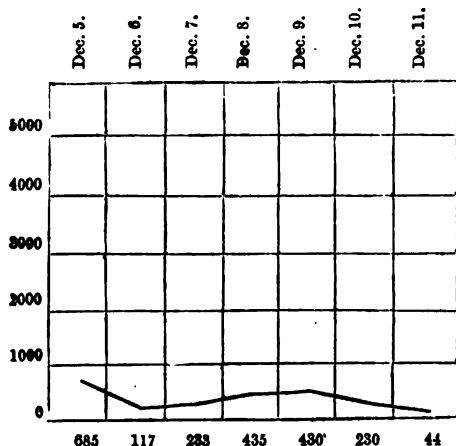
is immaterial. I added some of the wax solution used in the carbon process. Most of the failures I have come across in using the burnisher, or in seeing it used by other, resulted from the failure of keeping every part where there is any friction well oiled. In the Entrekin burnisher, the most important part is the oscillating plate to which the burnishing tool is fastened. This, being subjected to considerably more heat than the rest of the machine, soon gets dry by decomposition of the oil:

The Cutting of Masks for Medallions.—Medallions are generally printed with a white edge on one side of the oval, because photographers generally do not know how to make the oval which covers the picture while the border is being printed smaller than the opening of the mask which covers the border. A very simple way is to cut the mask for the border out of dry paper, and that which covers the picture out of damp paper. The damp paper, on shrinking, will give you an oval which fits loosely in the outside mask. Damp paper is easily cut by means of the Robinson trimmer, a little tool which every photographer ought to have.

METEOROLOGICAL REPORT SHOWING THE DAILY VARIATIONS IN THE AGGREGATE CHEMICAL FORCE OF THE DAYLIGHT OF THE SOUTHERN SKY. FROM OBSERVATIONS MADE AT BLACKPOOL IN LANCASHIRE,

BY D. WINSTANLEY, F.R.A.S.

THE daily average has again descended, being, for the past week, as 310 units to 395 for the preceding week, or within 28 units of the daily average of the last week in October, which is the darkest I have thus far recorded.



PYROXYLINE FOR EMULSIONS.*

It is not sufficient that the pyroxyline should be prepared at a high temperature in order to be fit and proper for the manufacture of an emulsion; it is also necessary that the product should be in the presence of an organic body capable of combining with nitrate of silver.

The importance of this has already been pointed out by several operators. M. Plücker, in recommending the employment of shellec in the collodio-bromide process, puts himself in the same position as he who resorts to the employment of guncotton manufactured at a high temperature; nevertheless, the emulsion, admirably modified at the time of its preparation, is not long before it undergoes modification.

This method, it is true, permits of the employment of pyroxyline made at a low temperature; but the little stability of the product thus obtained led to its speedy abandonment. Mr. Cooper, Mr. Dawson, and several other

skilful theoretical and practical photographers, have also specified from time to time different substances, which, although they often give good results, were, nevertheless, abandoned by reason of the lack of uniformity in the results. One of the most favourable conditions—or, we might even say, indispensable conditions—to the preservation of collodio-bromide, is a collodion containing, by the circumstance of the decomposition of the pyroxyline, an organic matter capable of combining with nitrate of silver.

How is it possible to recognize this particular state in the pyroxyline? it will be asked. Nothing is more simple, if one will only profit by the researches which have already been made upon the subject of collodion. The pyroxyline is dissolved in a mixture of alcohol and ether in such a proportion that it can be used as collodion. The solution having been clarified, a few drops of a solution of nitrate of silver in alcohol are added. If the conditions proper to an emulsion have been fulfilled, there is produced a whitish precipitate, which will blacken in daylight. If this reaction is apparent, you may prepare, without hesitation, an emulsion which will answer perfectly. In a contrary case, the collodion is poured into a bottle double as large as is required for the purpose, when the liquid will find itself in contact with a certain volume of air. In this condition the collodion is exposed to the action of direct daylight at a temperature of from 20° to 30° Cent. At the end of a few weeks or months, according to the quality of the pyroxyline, the necessary change will have been brought about, and the collodion treated with the solution of nitrate of silver will yield the characteristic precipitate of a good emulsion. This plan of analyzing the collodion has been indicated by Dr. Van Monckhoven in his researches on the decomposition of collodion.

Another method, which is indicated by Hardwich, consists in treating the normal collodion with an alcoholic solution of caustic potash; with collodions proper to the preparation of the collodio-bromide you may obtain a brownish colour, while at the same time the mixture exhales an odour of burnt calomel.

Finally, if it is necessary to employ a collodion already iodized and bromized, there remains still a third method of analyzing, a rather delicate one in practice, and this, also, is due to Dr. Van Monckhoven, who was the first to show a method of finding out whether a collodion was suitable for dry plate work. At the same time, this method is not so accurate for emulsions as the two preceding ones; moreover, it necessitates the employment of a bath absolutely free from ether or alcohol. You sensitize a plate with the iodized collodion that is to be tested, treat it as in the wet process, expose and develop with pure sulphate of iron. You then proceed to wash and treat the collodion film with pure nitric acid diluted with water. Collodions which are capable of making good emulsions will produce an image which will not completely disappear, but will, after this treatment, still be visible in the high lights.

Correspondence.

RELIEVING DISTRESSED PHOTOGRAPHERS.

DEAR SIR,—Will you kindly allow me to ask photographers not to give money to men that call upon them in distress, but to refer them to me?

I am induced to do this on account of the doings of a pretended photographer who I have had tidings of for nearly six weeks in different parts of the country, and always with different tales. He is an impostor, and has no more idea of working than of flying.

All cases of distress that are brought before this association are thoroughly investigated, and, where genuine, are relieved in a proper manner. Photographers, therefore, may send up their loose cash to H. B. Pritchard, Esq., the Hon. Treasurer, with a clear conviction that they are doing more

* Bulletin de la Société Photographique de Toulouse.

good than by relieving every impostor calling himself a photographer who likes to honour them with a call.

I am glad to say one thing in connection with the Benevolent Association, that we have not had a case brought before the Board yet that had any signs of imposture about it, all having been unmistakable cases of distress which were relieved thoroughly.—I remain, yours obediently,
174, Fleet Street, E.C., Dec. 13. W. T. WILKINSON.

SHALL PHOTOGRAPHERS HAVE TRADE SOCIETIES?

DEAR SIR,—The dispute on the "Ownership of the Negative" which you published last week in the *News* is not by any means the first of its kind which has occurred recently between photographer and sitter, and is not likely to be the last. It has again called my attention to an object which appears to me most desirable, viz., that of a trade's union amongst photographers. I believe that sooner or later such a union will be found not only desirable, but necessary to the welfare of our profession. We have many societies for the development of the art, but none in which trade subjects can be discussed, as you justly remarked in your leader of last week.

What I have to suggest is this: that to every photographic society there be attached a section devoted to purely technical subjects; a section which shall hold special meetings of its own a given number of times in a year, to discuss trade subjects only, such, for instance, as copyrights in photographs, ownership of negatives, the allowing photographer's assistants a half-holiday once a week, &c.; and that at these meetings resolutions shall be passed which all members shall be bound to support and carry out, each in their respective businesses. These trade sections might, if found desirable, eventually be joined into one society. By this means photographers will be able to combine and support one another in any disputes which might arise, and I believe the thing would be a success.—I am, sir, yours, &c.,
GROSVENOR.

AN "UNFAIR" CORRESPONDENT.

MOUNTAIN FORM AND FROST.

MR. EDITOR,—Allow me to ask the writer of the paper "Photography In and Out of the Studio," to *disprove* a statement of his own about the size of a mountain. He says that his wide-angle lens "depressed the tall mountain in front to half its height." This is a delusion with all those who cannot "look and see," or are deficient in form. Look out, Mr. Editor! for in this same *News* you exhibit another sinner, suffering from an iota of frost on the brain. My darling Editor! Have you already commenced to keep your Christmas? I would be glad to join you, but I must wait.—Your humble servant till
HANSIE MONDAY.

[Surely our correspondent cannot be familiar with the effects of false perspective given by the misuse of lenses of short focus, by which a mole-hill in the foreground is exaggerated to a towering mountain, and the mountain in the middle distance reduced to a mere haystack. Our fair correspondent—she must be a lady by the tenderness of her words of address, and the lack of logic in her style—must get some examples of this kind of work and look and see.—
ED.]

REDUCING NEGATIVES BY PERMANGANATE.

DEAR SIR,—With reference to the article in your esteemed paper of the 10th inst. respecting the employment of permanganate of potash to reduce the intensity of negatives reinforced by protosulphate of iron and silver, I beg to inform you that there exists the following error, and request that same may be rectified. The said error is this:—Allowing the permanganate to act upon the film for one minute would be rather too much, whilst mostly five seconds are

quite sufficient. I may, however, mention at the same time that a line cannot be drawn, this being a matter of appreciation on the part of the operator, and a careful remark of the effects thereof, according to the opacity of the negative, would be the only guide.—I am, dear sir, yours very faithfully,
A. LETALLE.

Birmingham, 14th December.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE first meeting of the session of this Society was held on Tuesday, the 14th instant, Mr. J. GLAISHER, F.R.S., in the chair. The minutes of a previous meeting having been read and confirmed, the following additional members, having been duly ballotted for, were announced:—Messrs. Dale Knapping, McLiesch, Warnerke, W. G. Hunter, S. G. Payne, Mrs. S. G. Payne, Messrs. F. W. Mills, R. Kennett, T. Bolas, G. Mansfield, W. Bates, H. Dixon, E. Pailthorpe, F. T. Palmer, B. Wyles, P. W. Radcliffe, and Miss Harriet Paget.

After a few words on the exhibition which has recently, closed, which, the President said, had been both a financial and social success,

Mr. E. VILES read an interesting paper on working large wet plates in the field. His paper will appear in our next. He exhibited a convenient appliance in connection with field work in the shape of a spirit level, which, having the indicating tube and spirit at the end, as well as at the side, permitted the operator to be sure of both vertical and horizontal accuracy of position, a thing he had found especially useful in using a swing-back to secure the accuracy of the plane of the ground glass. It was called a plumber's spirit level.

Mr. WILKINSON, referring to a case of the film splitting mentioned in the paper, said that he was accustomed to the manipulation of very large plates, and found the application of powdered French chalk to the plate a specific against splitting film, even if the plates were imperfectly cleaned. He suggested also that if the ball placed in the mouth of a bottle which Mr. Viles used, to rest large plates in whilst developing, were covered with American cloth, the plate would be held still more easily without risk of slipping.

After some conversation,

Mr. ENGLAND said he thought that a dish for developing had many advantages. It permitted the developer to be used without alcohol, and without risk of stain.

Mr. VILES found it inconvenient, in working large plates the field, to have to wash out a dish. In fact, he used no water whatever, and finished intensification, &c., at home. He found no difficulty in covering large plates without the aid of a dish.

After some further conversation,

Mr. HOWARD asked if the films which split were allowed to dry before intensification; as that, he thought, would tend towards splitting.

Mr. VILES said the films did not dry; they kept moist quite sufficient time to allow him to finish them at leisure. He should be glad to know if anyone had found any subsequent ill effects from the use or application of dilute albumen to films having a tendency to split, which he had found preventive.

Mr. HOWARD thought there was no danger. He had found no evil effects from the use of gums.

Mr. VILES had once tried gum, and he remembered that after they were varnished, the film cracked, assuring the well-known honeycomb like reticulation.

Mr. SPILLER remembered that something more than a dozen years ago he had been called upon, in conjunction with Mr. Wharton Simpson, to examine and report upon the causes of cracking in a series of valuable negatives which had been taken in India. They found then that gum had been applied previous to varnishing, and arrived at the conviction that it had been conducive to cracking. They were from dry plates also, a tannin preservative having been used, and the action of the tannin had, he had no doubt, been detrimental. The use of albumen he should think safe.

Mr. ENGLAND said that in regard to cracking after varnishing, he fancied the varnish was often to blame. He had been for some time using a shellac varnish, and found it stand perfectly.

Mr. HOWARD thought that a cause of cracking after varnishing was neglect to dry off every particle of moisture from the film by heat before applying the varnish.

After some further conversation and a vote of thanks to Mr. Viles, the subject dropped.

The CHAIRMAN called attention to the record of the daylight changes by Mr. D. Winstanley which had been appearing in the PHOTOGRAPHIC NEWS. He thought the record very interesting, but it should not be called a meteorological record. He understood that the mode of ascertaining the varied degrees of light was Roscoe's method. It was to be regretted that no really good photometer existed: the best was that of noting the action of light on sensitive paper.

The CHAIRMAN then announced that at the next meeting a paper would be read by Col. Stuart Wortley. He also invited members to resume the plan of bringing specimens of various kinds to the meetings, which at one time was a plan which gave great interest to their assemblies.

The proceedings then closed.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held in the rooms of the Society of Arts, John Street, Adelphi, on the evening of Thursday, the 9th instant, the Rev. F. F. STATHAM, M.A., &c., in the chair. The minutes of a previous meeting having been read and confirmed, Messrs. J. Good, G. H. Howard, and F. Höllyer, were elected members of the Society.

The SECRETARY then read the

Report for 1875.

"YOUR committee, in presenting their report for the year 1875, congratulate the members on the continuous prosperity of the South London Photographic Society, which has now concluded another session, evincing great vitality, and consequent realization of good results. As our Society is eminently a social one, so its mission should correspondingly be an appeal to similar qualities amongst the masses; and hence your committee refer with gratification to another phase in its history; viz., the institution of a popular meeting for the exhibition of lantern slides, produced by members and others, which holds out for the future both general and individual profit. The Annual Technical Exhibition Meeting has now assumed an important position in photographic circles, and has fully justified the intentions of its founder by the great interest and increased attendance which accompanies its yearly recurrence.

"In other ways the papers read and discussions arising therefrom have possessed much and varied interest, and have in some instances formed new standpoints in the practice of photography. The following papers have been read during the session, viz.:—'On the Nitro Sulphur Light,' by J. Spiller, F.C.S.; 'On Stereoscopic Transparencies,' by F. Howard; 'On the Relation of Lighting and Exposure to Texture,' by G. Croughton; 'On Photographic Stages,' by E. Cocking; 'My Experience During the Last Season,' by F. York; 'History of Carbon Printing,' by J. R. Sawyer; 'Archer's Formula,' by W. Wilkinson; 'A Novel System of Masking and the Production of Brilliant Results from Weak Negatives,' by W. Brooks; 'Uranium and Its Uses,' by J. Werge; 'Negatives on a Transparent Film,' by Leon Warnerke; 'On Impurities in the Negative Silver Bath,' by S. Fry; 'A New Studio Window,' by H. Vanderweyde; 'A Simple Method of Printing Ornamental Borders on Carbon Prints,' by E. Foxlee; 'A New Way of Finishing Photographs,' by E. Danmore.

"Photographs, apparatus, and exhibition of various processes have been shown by the following gentlemen, viz.—J. R. Sawyer (Carbon Printing), R. Kennett (Emulsion Process), Leon Warnerke (Sensitive Negative Tissue), and S. Fry, J. Spiller, F. Howard, Fernelay, F. York, Oakley, G. H. Simpson, G. Croughton, W. Brooks, J. Werge, H. Vanderweyde, Cleary, E. Foxlee, Murray, Howarth, J. Nesbitt, Baynam Jones, A. Brittlebank, D. Waymouth, and A. Dallas.

"A large accession of new members during the session has increased the power of the Society to carry on its work with a greater amount of prestige than it has hitherto been enabled to do.

"In conclusion, your committee feel that as long as the pleasure arising from social reunions continues amongst those who practise a common study (where art and science are united) so long will be the prosperity of the South London Photographic Society."

The Treasurer's Report, being read, showed the income, with last year's balance in hand, to amount to £44 10s. 1d., and the expenses to amount to £35 3s. 11d., leaving a balance in hand of £9 7s. 2d., and assets in the form of uncollected subscriptions to the amount of nearly £20.

The following gentlemen were then elected as officers of the Society for the coming year:—

President—The Rev. F. F. Statham, M.A., F.G.S.

Vice-Presidents—G. Wharton Simpson, M.A., F.S.A.; Jabez Hughes; Wm. Brooks; John Spiller, F.C.S.; F. York; Frank Howard.

Committee—Messrs. Aldridge, Ayres, Hunter, Foxlee, Wilkinson, Dunmore, Warnerke, Barnes.

Treasurer—Edgar Noel Fitch.

Secretary—Edwin Cocking.

After some votes of thanks,

Mr. DUNMORE read a paper on a new mode of finishing photographs (see p. 602), and showed a series of fine examples of the method described.

After a vote of thanks, a conversational discussion arose, in which a variety of substances—such as shagreen, engraved metal plates, or any substances giving a matt or grained surface—were suggested by Mr. Dunmore as equally applicable to the purpose of producing a margin less polished than the oval centre containing the portrait, and so by contrast giving an effect of higher finish.

Mr. KENNETT then exhibited his improved tripod stand, in which the sliding legs for elongating the stand were held by sliding metal bands instead of screws. The stand received general commendation, and a vote of thanks was passed to Mr. Kennett.

The CHAIRMAN then called attention to the annual dinner to be held at Anderton's Hotel, Fleet Street, on Saturday, the 18th instant, at half-past five; after which the proceedings terminated.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 5th ult., M. BALARD, of the Institute, in the chair.

M. FABRE, of Toulouse, announced the formation in that city of a photographic society, and the publication of a *Bulletin* to contain its proceedings.

M.M. LACHENAL, FAYRE, et CIE, and M. THIEL, called attention to the arrangements made for the convenience of those photographers intending to exhibit at the International Exhibition of Philadelphia.

M. BELBEZE hoped that at the next exhibition of photographs there would be a competition for dry plate pictures.

The Society, acting on the suggestion, decided that a medal of the value of five hundred francs should be given for the best dry plate picture, and the committee were instructed to draw up the regulations necessary to a competition.

M. LIEBERT offered a prize of five hundred francs for a method to shorten the time of exposure.

M. CARETTE presented the Society with a copy of "Retouché Photographique," of which he was the editor. Another work from the pen of M. Klacry, a photographer of Alger, was presented, on a method of reflecting light upon the model by means of a coloured screen turning on a pivot.

M. RODRIGUES, of the Portuguese Geographical Institute, presented the Society with his collection of pictures exhibited at the Geographical Congress at Paris.

M. MIGURSKY, of Odessa, explained the method adopted in Russia for obtaining natural clouds in landscape pictures. One commenced by taking a cliché with a very short exposure. In this way a silhouette, or dark image, was obtained with the sky perfect. A second cliché, fully exposed, gave the details of the landscape. It was then a very simple matter to adapt the sky of the first negative to a print of the second. M. Migursky also called attention to a style of printing which might be termed the mirror of mystery. A carbon print was transferred to a mirror, which, instead of being silvered, was gilt; if the image was put on the reverse, it was only visible by transparency, so that it formed a sort of mystic mirror, showing the image of any person one desired to see on the observer looking into it.

M. BATNAZ showed a little apparatus for closing bottles hermetically.

Among others, a communication on "Pyroxiline for

Emulsions" was read from the *Bulletin de la Société de Toulouse* (see p. 608).

M. DESPAQUIS read a communication on photo-printing in greasy ink.

M. CHARDON exhibited a fine collection of carbon prints.

M. VAN TENAC exhibited an apparatus for practising wet plate photography in the open air.

The AUTOTYPE COMPANY submitted a fine collection of prints.

M. LEON VIDAL showed two photo-chromic reproductions of paintings.

M. STREBBING exhibited a large number of pictures obtained by means of platinum salts, and explained how they were secured.

The proceedings then terminated.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE ordinary monthly meeting of the Board of Management was held on Wednesday evening last, at 174, Fleet Street, Mr. W. S. BIRD in the chair.

The minutes of previous meetings having been read and confirmed, Messrs. Evans, Dighton, Loydon Boucher, Thomas, Harnack Dennis, and James were admitted members of the association.

The Secretary was instructed to write and thank the President and Council of the Parent Society for the use of the late exhibition on the 18th ultimo. The Secretary was further instructed to engage the Co-operative Institute for an evening about the 24th of January, for the second annual entertainment.

In reply to queries, the Secretary announced that Mr. E. Cocking had kindly undertaken the musical portion of the programme; and that Mr. York would again exhibit the magic lantern, and the Secretary would do the lecturing.

A petition was presented for relief, which, after discussion, was voted ten shillings per week, for a period not exceeding ten weeks, and as the applicant was not a member, he was granted the privilege of advertising in the Employment Register issued by the Secretary. The fact of the applicant not being a member called forth a discussion as to when it would be desirable to announce that non-members would not be relieved, which, after a brief discussion, was adjourned.

W. T. WILKINSON.

Talk in the Studio.

MR. ALDERMAN NOTTAGE.—Photography, the newest of the arts, the newest of the industries, and the most recent of the branches of commerce, definitely took a position amongst the most ancient of the representative institutions arising out of industry and commerce—the Corporation of London—on Wednesday, the 8th instant, when Mr. Alderman Nottage, of the Stereoscopic Company, gave his inaugural dinner, the Lord Mayor of London, the Sheriffs, and upwards of two hundred noble and distinguished guests being present. It would be out of place in our columns to enter into any detailed account of such a festive celebration; but as we regard the occasion as noting a worthy association of success in the commercial development of the new art of civic honours, in which all our readers are interested, we put the event on record; simply adding that for perfect taste, perfect organization, profuse hospitality, and elegant comfort, we have rarely seen any public or private dinner so successful.

LAMBERTYPE, ETC.—We are asked to call the attention of photographers interested in M. Lambert's processes to the circumstance that M. Lambert will be in Greenwich from January 3rd to January 12th. We learn from two or three correspondents in the North of England that M. Lambert has met with a warm welcome amongst many of the photographers there. One gentleman has secured exclusive licences for four towns, not to contain, but to diffuse, he is so delighted with the processes. The number of recent licensees appears to be very large.

PHOTOGRAPHIC CHRISTMAS CARDS.—Referring to the remarks on the use of Photographic Christmas Cards, Mr. W. Wright calls our attention to some prettily-designed medallion mounts for card pictures, the subject of the designs being well suited to Christmas associations. If these mounts were better known we think they would be much used with portraits as

amongst the friendly souvenirs exchanged between friends at this festive period. Mr. John Terras also sends us some card photographs intended as Christmas souvenirs. Some of them are very pretty. Mr. Terras has not found them successful with the public. Possibly a variety of reasons may influence this matter, which we may deal with at another time.

THE LATE ECLIPSE.—Referring to some correspondence on the subject which took place a few months ago, and appeared in our pages at the time, Dr. Schuster writes to *Nature* as follows:—"On my return from India I should like to say a few words about some letters which appeared in the *English Mechanic* during my absence. Mr. Proctor, and a writer signing himself 'A Fellow of the Royal Astronomical Society,' comment in these letters on the result of the late Eclipse expedition. It would be better if these discussions were postponed until the results are published by the Royal Society, but if writers who have not heard anything beyond a few short telegrams take it upon themselves to enlighten the public as to the value of photographs which they have not seen, a few remarks of one who has seen them become necessary. If the telegrams written by me have given rise to the misunderstanding, I am sincerely sorry for it. I have had no personal interest either in the success or the failure of the expedition. 'The Royal Society has done me the honour to entrust me with the task of carrying out a programme sanctioned in detail by the Eclipse committee. This I have done to the best of my ability, and in wording the telegrams in question I avoided carefully any expression which might have raised expectations not to be fulfilled on the arrival of the photographs. If the impression has been propagated that the expedition has not obtained any results of great importance, it is the fault of those who, thinking I had an interest in exaggerating the importance of the results, have taken away from the meaning of my words, which in reality remained far below the truth. There cannot be the slightest doubt that the photographs obtained by the prismatic camera are full of interest and importance. They solve the question in which part of the spectrum the chief photographic rays of the corona are situated. They open out almost an entirely new field of inquiry, answering questions which could never have been answered by any other method, and suggesting new questions to be answered hereafter. I should have liked to postpone the question whether it is possible to photograph in all its details the spectrum of the corona in the time available during eclipses until Mr. Proctor's long-promised mathematical solution has appeared. As, however, we have had to wait for it already a considerable time, I venture to submit to your readers the following considerations:—The prismatic camera is a spectroscope without collimator. It has given us photographs after one minute's exposure, and would have done so in less time under more favourable atmospheric conditions. If we add a collimator and telescope to this camera, we shall have an arrangement similar to that which actually was employed for the photographs of the spectrum. If the lens of the telescope is, as regards diameter and focal length, like that of the camera; if, further, the focal length and diameter of the collimator lens is such that it would collect all the light which passed through the objective of the telescope; if the slit plate was removed, the only diminution the intensity of the light would be caused by the absorption through the two additional lenses and by the diffraction of the slit. The influence of diffraction can be reduced to a minimum by suitably altering the aperture of the collimator lens, and by using a slit not too narrow. We should thus have an instrument capable of photographing the spectrum of the corona in one minute. This is not the place to discuss whether the failure of the spectroscopic cameras was due to atmospheric causes, to the instruments employed, or finally, to my own fault. It will, I believe, be found hereafter, that the experience gained by even these failures will prove useful on future occasions. In enumerating the results of the expedition the photographs of the corona and the sketch taken by the Hon. H. N. Shore ought not to be forgotten. The time observations were conducted with as much accuracy as the instruments permitted."

CHLORIDE OF GOLD AND POTASSIUM TONING BATH.—Dissolve dentists' waste in the least quantity possible of aqua regia (one part nitric, two parts muriatic acid), add drop by drop, stirring meanwhile with a glass rod, a strong solution of caustic potassa until the solution is slightly turbid, then add a few drops of muriatic acid to clear it; add water until you have ten grains of gold to the ounce of solution. For toning,

use one grain of gold and five grains of acetate of soda to five sheets of albumen paper, neutralize with chalk. Mix about three hours before using.—*Western Photographic News.*

KALSO-MINE.—This term is used in America for painting in distemper. The following hints, given in the *Scientific American*, may be useful in background painting:—"To kalso-mine a good-sized room with two coats, take ten pounds of whitening dissolved in hot or boiling water; one-fourth of a pound of glue (which should have been put to soak in a pint of water the night before) may now be melted slowly on the back of the stove, stirring frequently. To colour a beautiful tint, get two ounces of ultramarine blue and one ounce of venetian red; mix separately with cold soft water, and strain through a stocking or thin cloth, each in a separate vessel. The whitening may now be stirred well; if too thick, add more hot water, and strain through a flour sieve into a good sized pot. Add some of the blue and red, alternately, till you get the desired shade, which may be ascertained by putting a little of the mixture on a piece of paper and drying by the fire. When your colour is determined, pour in the glue; and after mixing well, apply the wash hot to the walls, brushing in any direction, as it mixes better than if put on too carefully. On white walls two coats are necessary; but after the room is once done, one coat is sufficient. Should the ceiling have to be done, put on the whitening alone first, then reheat the wash and add the paints and glue, the latter to be light-coloured if the walls are to be white. Common glue will answer for a painted wall. A paper border finishes the room perfectly—makes any room neat and pretty. Should the second coat not be put on till next day, heat the mixture, as the glue will not mix with the other ingredients unless pretty warm."

To Correspondents.

H. DUNNING.—For a north light, the fabrics you forward are unnecessarily heavy and dark for curtains. Common calico, white or blue, would serve, or the thinnest and cheapest of those you enclose. For the side we should prefer curtains with rings, sliding on a brass rod; and for the roof a series of blinds (say three), running on rollers placed at the ridge of the roof.

JOSEPH STOKES.—The piece of smeared paper, which looks like some wild design, has got slipped into your News by accident when in the hands of the folders. It has, apparently, been used as a mask in stencilling black bordered note paper.

J. C. LEITCHER.—Bates' black varnish will answer most purposes that you require. Brunswick black diluted with turpentine, or with coal tar naphtha, will answer. If applied somewhat thick, it will dry bright. If you want it quite dull, dilute and grind up a little bone black with it.

JOHN PATRICK.—Our correspondent slightly mistakes the aim of the YEAR-BOOK. Whilst, as a rule, it contains material which makes it a tolerably complete manual of practice, it is intended chiefly to record the progress of the year, and represent the practice of the art in such degree as it has been modified by discovery or experience. We rarely repeat old processes in the YEAR-BOOK, unless some point of novelty be involved. Hence, unless some new or improved mode of photographing on wood have been announced during the year, none will appear in the YEAR-BOOK. The best method at the present time—provided the operator have any familiarity with the operations—is to produce a photolithographic transfer, and put the image in printing ink on the wood instead of upon stone.

C. A. B.—There are two or three ways of placing photographs in scrap books without cockling. One very good plan is to attach them only at the four corners, taking care to draw the print tight. Another plan is to use india-rubber cement for mounting. This answers well, but has a drawback: in the course of years—perhaps a dozen or twenty—the india-rubber perishes, and the prints become loose, and sometimes also discoloured with the change in the india-rubber. A third plan is to employ the preparation of glue in alcohol sold for the purpose. Marlon and Co., of Soho Square, sell it, we believe. 2. We should keep a stock of bath No. 1 and No. 2, using each for special purposes, and often using a mixture.

DUNCE.—Yes, your proportions will serve, and we have no doubt that such a studio will give good results. You will often find it an advantage to place the sitter slightly quartering towards the side-light, the camera being placed in the corner. A reflecting screen in the unlighted side will be required.

P. S.—The powder process can be worked on any kind of paper. You will find details in our forthcoming YEAR-BOOK. We have not space for giving complete instructions for a process in this column.

AN AMATEUR.—The value of uranium in the nitrate bath for wet plates is a disputed point. Many operators speak well of baryta. It is simply dissolved by addition to the nitrate solution.

GALA.—The ether will do no harm whatever. The only difference you will experience will be that the ether will evaporate more quickly than the alcohol.

JOHN THOMAS.—The quick and constant recurrence of pinholes that you describe is very tantalizing, and, unfortunately, very difficult indeed to prescribe for. Receiving only general descriptions, and not knowing the minute history of each case, we can only prescribe for general causes. As a rule, the cause of pinholes is the accumulation of iodide of silver in the bath, which supersaturating the solution is easily precipitated on the plate, giving it the sandy appearance you describe, and issuing in pinholes in the negative. The various modes of getting rid of iodide we have often described both in the News and our YEAR-BOOKS. Diluting and filtering; adding a little carbonate of soda; adding a few drops of hydrochloric acid, and various other plans, all have their advantages. Boiling does not necessarily precipitate the iodide. One cause of the ready recurrence of pinholes is the use of a small quantity of solution. It is better to use a couple of gallons than a pint. Cold weather increases the tendency. Read what we have said in various YEAR-BOOKS and News articles. The cards are pretty. Probably a variety of causes may prevent their sale.

R. S.—We have not much faith in the process.

W. L. T. asks us whether oil colours or water colours are best for colouring photographs. That is purely a question of taste. Each answers equally well for certain pictures. Oil colours are most desirable for large pictures, and water colours for small pictures. Obtain the manual of "Harmonious Colouring as Applied to Photographs," price one shilling, of Newman, Soho Square, which will give you all the information you require.

RECEIVED, with thanks: B. Wyles, A. Asher, J. Barker, T. S. Hicks, Sydney Smyth, R. Slingsby, Wallis Clements, J. S. Tulley, L. Warnerke, and others.

METEOROLOGICAL REPORT FOR NOVEMBER.

BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven,
36 feet above sea level.

Date.	TEMPERATURE			BAROMETRIC PRESSURE			Direction of Wind at 9 a.m.	REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1	42°	46°	43°	Register accidentally destroyed.	Register accidentally destroyed.	Register accidentally destroyed.	S.S.E.	Heavy rain a.m. and p.m.
2	41	44	40				S.S.E.	Rain p.m.
3	40	46	44				S.E.	Showers a.m. and p.m.
4	41	46	43				S.	Fair, but gloomy.
5	46	—	43				S.	Rain a.m. Windy.
6	40	41	37				S.	Rain a.m. and p.m.
7	39	40	40				S.W.	Rain a.m. Windy p.m.
8	40	47	45				W.	Heavy showers this afternoon.
9	43	45	43				S.W.	Occasional showers all day.
10	42	46	43				S.W.	Fair, generally sunny.
11	43	43	43				S.S.W.	A little rain this morning.
12	40	44	35	29.37	29.82	29.68	S.S.E.	Fair, but gloomy.
13	39	42	41	29.63	29.41	29.11	S.E.	Rain p.m. and p.m.
14	44	45	39	29.05	29.03	29.23	N.	Rain p.m., with strong wind.
15	41	45	40	29.48	29.32	29.64	N.	Rain a.m. and p.m.
16	48	44	41	29.69	29.69	29.67	N.W.	Rain a.m. and p.m.
17	48	49	47	29.70	29.71	29.63	N.W.	Rain a.m.
18	49	49	47	29.30	29.62	29.90	W.N.W.	Fair, generally sunny.
19	46	48	40	30.00	30.15	30.00	S.	Fair, generally sunny.
20	37	43	38	29.73	29.51	29.33	S.E.	A little rain p.m.
21	34	39	38	29.34	29.38	29.47	E.	Fair and sunny.
22	36	41	35	29.50	29.51	29.56	E.	Fair, generally gloomy.
23	40	42	40	29.55	29.40	29.30	S.E.	Fair, but gloomy.
24	41	40	39	29.80	29.30	29.29	—	Fair and sunny.
25	31	39	39	29.30	29.62	29.89	E.	A little snow p.m.
26	35	38	36	30.01	30.04	30.10	N.E.	Fair and sunny.
27	35	40	33	30.13	30.09	30.08	N.E.	Fair, generally sunny.
28	32	39	33	30.11	30.12	30.16	N.N.E.	Fair, but gloomy.
29	27	37	32	30.18	30.19	30.20	N.	Fair, but gloomy.
30	30	34	32	30.20	30.22	30.23	N.	A little snow this morning.

Summary.				Mornings. Noons. Nights.		
Maximum temperature observed	...	...	...	49°	49°	47°
Minimum ditto	...	...	...	27	34	29
Mean ditto	...	...	...	39.6	43	39.3

Mean of all observations	...	...	...	40.64		
Number of fair days	...	...	...	13		
Number of days on which more or less rain fell	...	...	...	17		
Number of fair days, sunny	...	...	...	8		
Number of fair days, gloomy	...	...	...	9		

NOTES.—From the foregoing table it may be observed that cold, frosty weather commenced here about the 25th. It has continued up to to-day, and we have had some severe frost, affording much skating amusement on the neighbouring ponds. Having to-day commenced a rapid thaw, those who believe in the old adage, "When the ice bears a man before Christmas, it will not bear a goose after," may expect a comparatively mild winter, and we shall have an opportunity of testing its accuracy.

The Photographic News, December 24 1875.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. PROFESSOR ADAMS' EXPERIMENTS WITH SELENIUM—ACCIDENTS IN REDUCING RESIDUES.

Professor Adams' Experiments with Selenium.—The remarks of the President of the Photographic Society at the last meeting of the Society, to the effect that it was to be regretted that no really good photometer existed, lead us to bring up once more the subject of selenium, especially as the paper recently communicated to the Royal Society by Professor Adams, M.A., F.R.S., deserves to have some notice taken of it by photographers. Last week we called attention to the circumstance that selenium could be made exceedingly sensitive to light, so far as its conductivity of electricity is concerned, by heating it for some time at a high temperature, and that even in its normal condition, as Professor Adams shows, it might be employed in the construction of a trustworthy and ready measure of light. Professor Adams has sought to discover what elements of light it is that render selenium a so much better conductor in daylight than in darkness, and he has come to the conclusion that the action upon the selenium is due principally, if not entirely, to radiations belonging to the visible part of the spectrum. This entirely agrees with M. Siemen's results, which we mentioned last week, for that gentleman distinctly states that the dark heat rays do not in any way influence selenium. Light rays of all kinds do so, however, particularly, Professor Adams tells us, a greenish yellow, a circumstance which will strike photographers with particular interest. The change exerted upon selenium by daylight is, as we have already pointed out, very marked, and we are now in a position to state precisely to what degree. Professor Adams found that the needle of his galvanometer (which indicated the degree of conductivity of the selenium) was not affected at once, when he lit up a darkened apartment containing the selenium photometer with an ordinary Bunsen flame, which is non-luminous; but after several seconds the needle make a slight deflection, equal to ten divisions of the scale. On the flame being made luminous, however, there was a sudden deflection, which increased to 250 divisions of the scale in a few seconds. The light of an ordinary Bunsen could scarcely be measured, but it is estimated at 1-200th part of a candle, while the luminous Bunsen is set down as equal to ten candles. Therefore, a faint illumination equal to 1-200th of the light of an ordinary candle sufficed to affect the selenium visibly, such an illumination as most photographers would not hesitate to use in their dark rooms. One cannot very well exaggerate the value to a photographer of such a delicate photometer, if one could be constructed out of selenium. For testing dark rooms when one has to work with the delicate films given by some dry plates, a photometer of this kind would be invaluable. Dark rooms, whether lighted by coloured glass, or through tinted calico or tammy, are well known to get less light-proof by degrees, if sunshine, or any strong light, is permitted to act upon the screens, and a selenium photometer, therefore, would prove a capital tell-tale under the circumstances, if only it could be produced in a simple enough form. Even moonlight has an effect upon selenium, for Professor Adams says that "on throwing the moonlight on the selenium by means of a plane mirror, the needle was at once deflected twenty divisions of the scale." And he further states that this deflection was increased to forty divisions on placing the mirror outside the window, so as to send the moonlight perpendicularly through the window on the selenium, and this, too, with the window closed. No better proof could be afforded of the sensitiveness of selenium and of its suitability for making a photometer. The change of resistance (resistance and conductivity may be taken as opposite terms) produced by exposure to daylight sometimes amounts to as much as one-fourth of the whole resistance. Thus, by way of example, it may be mentioned that the normal resistance exhibited by selenium on passing

a current of electricity into it is put down at about 4,400 ohms, and this number is marked on the galvanometer when the selenium is in the dark; a luminous Bunsen burner (equal to ten candles) reduces the resistance (or increases the conductivity, which is the same thing) by rather less than 1,000 ohms, so that the needle of the galvanometer would at once point to 3,400 ohms on exposure of the selenium to the light of ten candles. We share the hope of the President of the Photographic Society that we may not long be without the possession of a delicate and handy photometer, and it seems to us very probable indeed that selenium will furnish us with what we want.

Accidents in Reducing Residues.—The recent accidents in American studios connected with the evaporation of silver baths containing glycerine call to mind a lamentable occurrence that took place about ten years ago at Pesth, and which we are glad to hear has not since been repeated. In the case of the American studios it is supposed that free nitric acid must have acted upon the glycerine and formed nitroglycerine, one of the most terrible, because most treacherous, of our explosives. In the Pesth catastrophe, the cause was said to have been the presence of a large proportion of alcohol or ammonia in the residue, and the formation of fulminate of silver, or some such compound. In the case to which we allude, which our readers may have forgotten, a travelling photographer, well known in the neighbourhood, called upon a chemist in Pesth with some photographic residues, from which he desired the silver to be extracted. The residues remained some time in the laboratory, and in the end were handed over to an assistant to be reduced. In order to remove the precipitate, which had become perfectly dry and attached to the glass vessel in which it was contained, the assistant began to scrape it with a pair of scissors, when a fearful explosion immediately took place, that was heard throughout the town and neighbourhood. The body of the chemist was found mangled and literally torn in two pieces; the assistant had been thrown to the floor by the force of the explosion and killed on the spot; while a little boy, the chemist's son, who had been watching the operation, was found stunned and bleeding, but otherwise comparatively unhurt. He alone could give what meagre details were forthcoming, but that the mixture under manipulation was made up of photographer's residues there was no doubt. An inquiry into the matter was made by several Austrian scientific men, and the results of their deliberations we published in these columns at the time, which was to the effect that no explosive compound of any description can be formed in photographic residues when an acid is present in combination, and that such a result only was possible when the residues contained large quantities of ammonia. It was therefore recommended that residues should be first treated with a small quantity of acid before being reduced. Only if there is a risk of forming nitroglycerine by the chance presence of glycerine in the residues, it would scarcely be advisable to employ nitric acid for the purpose.

The Promenade Portrait.—The novelties in size introduced during the year have not received so much attention as might have been anticipated. The Boudoir size, introduced by Mr. Blanchard, had surely sufficient claims to novelty and fitness to have secured for it a cordial reception amongst portraitists, to whom any novelty which affords a stimulus to business should be welcome. The Promenade size, introduced in America, appears to have been pushed more, and is acquiring some acceptance on the Continent. In Berlin it seems to have been adopted, and we print an article on the subject in another page from the *Mittheilungen*. Like the boudoir portrait, the promenade portrait is a narrower picture than the cabinet or carte; so that in this respect the new fashions of London and America are the same. The promenade picture is, however, much smaller than the boudoir, being about a third of an inch higher than the cabinet, and about the same amount narrower. It is possible that this alteration in the proportions will be

pleasing to many, but it will be a question whether album manufacturers will deem the difference sufficient to warrant them in making books to take portraits so nearly of a size. There exists one serious drawback against the success of the promenade picture, we cannot help thinking: it is so very much like the present popular portrait sizes. The public may like to have a carte or cabinet taken, or something in a grander style, in which case they may now choose the boudoir format; but it is hardly likely they would choose a size so nearly allied to the cabinet. It is suggested that the broad cabinet, or slender promenade, should be delivered by the photographer according to the figure of the model; but in this case we must suppose the co-existence, in every drawing-room, of a cabinet and promenade album, for if both pictures were made to fit into one and the same framework, there would be little good in having two different sized mounts. We do not, however, desire in any way to stand in the way of introducing novelties; on the contrary, we think that photographers do quite right in bringing before the public novelties of one kind or another, for, beyond its commercial aspect, such a step exercises the artist in the different branches of his calling. But we think that instead of merely altering in a slight degree the measurement of the photograph, more good would be done by introducing changes in the character of the portrait itself. The main thing with the professional portraitist is to captivate the goodwill of the public, and this he is more likely to do in the way we have mentioned, from the fact that the family albums which exist and require to be filled must needs be completed with portraits of a particular size. We must come to an understanding as regards the size portraits should be, so as to obtain albums of proper dimensions; and the carte and cabinet fully satisfy us in regard to photographs of smaller dimensions. There is no reason, of course, why other sizes should not become as popular, especially in the case of large pictures like the boudoir portraits; but, if photographers want to change their pictures frequently, it should be the style, rather than size, that is altered. While on the subject of photographic novelties, we would ask, why cannot photographers do something now-a-days with note paper, address cards, and articles of fancy stationery, of which large demands are made by the public? There ought to be a dozen different ways in which portraits might be tastefully utilised in this connection, and thus a new and extensive field opened up for the benefit of photographic portraitists. Why should lithographers and engravers have everything their own way in these matters?

FRENCH CORRESPONDENCE.

THE PHOTOCROMIC PROCESS—PRINTING OF PORTRAITS IN COLOURS—M. LEON VIDAL'S LICENSES—TWO FRENCH YEAR-BOOKS—THE TOULOUSE SOCIETY—PINHOLES IN NEGATIVES.

WHILE seeing even the surprising productions which daily emanated from the Photocromic Studio directed by M. Leon Vidal—copies of paintings and of all sorts of works of art—there were still some sceptics who disbelieved that the same success would attend the production of portraits in colours. There were some, even, who pretended that the thing was impossible, and were ready, indeed, to prove it by mathematics.

To-day the first are convinced, and the last are compelled to hold their peace. In effect, they have had before their eyes productions which cannot be gainsaid. It is only a few weeks ago that M. Vidal signed an agreement with the principal Paris photographers to the effect that he bound himself to print in colours all clichés which they should confide to him, at certain fixed prices, paid in advance, and in this way the public will be able at once to share in the invention, while both photographer and inventor will be benefited by the transaction. Agreeably to this compact, portraits of the most varied nature have been

remitted to M. Leon Vidal by his privileged clients, and in the space of a few days the orders were executed, and we may at once say that all have been delighted at the results obtained. There is, indeed, something magical in this transformation into an exquisite painting of a cliché, which we have been so long accustomed to see reproduced only in black. And the painting, in the creation of which it is seen that the hand of man has had nothing to do, possesses a most taking appearance. It is so harmonious, so delicate, so transparent. You look in vain for lines, or for the markings of the brush; you only find a model, which light alone has produced.

The public will be much surprised when they obtain these magical portraits, for they resemble nothing closer than water and oil colour miniatures of the most artistic character.

So far as we are concerned, we do not hesitate to declare that the success obtained is as complete as possible, and, further, we are not afraid of saying that the portrait-pictures are the most successful of the heliochromic productions, for they show to the greatest advantage the merits of the process.

At this moment, M. Leon Vidal is occupied in treating with the principal provincial photographers, in the same way as he has done with those in Paris; but he makes this difference, that in every provincial town he will only have to do with one single photographer, and the privilege of availing himself of the photo-chromic process is accorded for the sum of 300 francs per annum, the tariffs charged for the prints being the same as that fixed for Paris portraitists. He has already concluded several compacts under these conditions.

Since we are talking of M. Leon Vidal, let us mention that his *Agenda Photographique*, in which, as a matter of course, are to be found several specimens of his work, is at the point of being finished. This little volume, whose form will be a very convenient one, will contain a mass of useful matter, and, it is hoped, will be published before the close of the present year.

By a curious coincidence, which, nevertheless, does not unfrequently happen when it is a question of satisfying a public want, M. Fabre, of Toulouse, has been seized with a similar idea, and announces also the publication of an *Agenda Photographique*, or *Aide Memoire de Photographie*, based upon the same sort of programme. We are satisfied that both of these little volumes, whose usefulness is incontestable, will have their due share of public support.

M. C. Fabre, of whom we are speaking, is the secretary of a new photographic society which has just been formed at Toulouse, and which, notwithstanding the difficulties inherent to the starting of such an association, appears to be upon a solid basis already. Besides the professional photographers, of whom there are a large number in the old capital of Languedoc, several distinguished amateurs have given in their names to be enrolled upon the list of members. The young society has but few expenses, and the subscription is fixed, therefore, at the moderate rate of twelve francs per annum, so that membership is within the means of all. A *Bulletin* or organ has been started, containing the proceedings of the society, and this, of which three numbers have been printed, is issued gratis to all members. No sooner has the society started than two series of medals are offered for the best tourist or travelling apparatus for working dry plates: one class of medals will be given for camera and stand, the other for lenses. The competition will take place in April next.

As to the *Bulletin* of this young society, it is not as yet very rich in practical papers. The first numbers, which are in our hands, contain little else than the transactions of the society. There is, moreover, a translation of an article by M. Carey Lea, on emulsions, and a few gleanings from other journals. Nevertheless, we find, in the third impression, an article upon pinholes in the negative. The author, who has experimented with different means recom-

mended to prevent these defects, gives the preference to the addition of carbonate of silver to the sensitiser. He recommends the addition to the nitrate solution of five grammes of bicarbonate of soda for every hundred grammes of nitrate of silver that has been employed. The precipitate formed is allowed to fall, the clarified liquid is decanted off, iodized as usual, and filtered. As the solution is employed, it is poured back into the stock-bottle containing the carbonate of silver. In this way the author assures us that the pinholes are completely prevented, and the solution, always kept in a neutral condition, is freed from time to time of any organic matter it may contain. Before use, two cubic centimetres per thousand of nitric acid should be added. This trace of acid is sufficient to prevent the production of fogged images.

ERNEST LACAN.

PROMENADE PICTURES.

BY PROF. H. VOGEL.*

PHOTOGRAPHY is governed by fashion. As the fashion of our garments changes, so also do our photographs. The changes, so far as style is concerned, are of a varied kind. In the first place, as regards the figure; the full-length portrait was followed soon after the introduction of the *carte-de-visite* by the bust and three-quarter portraits; then a change was made in the mode of lighting, and we had the Adam-Salomon and Rembrandt styles; and finally, in respect to the size and shape of the pictures, there followed the *carte*, the *cabinet*, and *Victoria*, the last-named being but very short lived.

With the desire of again bringing forward something new, no less than three different *formats* have been started simultaneously, the *imperial* and *boudoir* style, which are materially larger than the cabinet; and a third, the promenade picture, which is not very different in size to the cabinet. Our readers need, however, be in no way exercised in mind just at present about these novelties. It is very easy to invent a new *format*. Nothing but a pair of scissors is required for the purpose of cutting down a large picture to smaller dimensions, but it is another matter altogether to introduce the size successfully. This is difficult, and to do it something more than a pair of scissors is necessary. You require a public, in the first place, that is pleased with the new photograph, and gives orders for them; then properly cut and printed cards for mounting the pictures; and finally, suitable albums for their reception; new lenses are less required, probably, for the instruments in any good studio will no doubt be found matter suitable for the novelty. Without expense, the cannot be attempted, and the humble photographer will therefore do well to let his bigger brethren undertake the experiments which will be necessary first of all before the three novelties we have mentioned can be properly brought before the public. In large studios the printing of a few hundred cards in the new styles, and the production of as many pictures of some attractive young actresses to serve as parade-pictures, would be an expense scarcely felt, and the novelties would be put in the reception-room to satisfy those asking for the very latest fashion in photographic portraits. Should the pictures find favour with the public, there would still be plenty of time for photographers in a smaller way of business to take up the matter.

In my opinion, the larger styles can count on very little sympathy; they will obviously be more expensive than cabinets, and that will be a grave objection during the present bad times. I do not, however, set myself up in any way as a prophet, for when I expressed my opinion ten years ago upon the subject of the cameo prints, which came to us as a novelty from England, and stated, as turned out to be the case, that the fashion would not last long, several gentlemen were much put out by my statement, maintaining that my remarks stood in the way of

their business interests. I must guard myself, therefore, from such insinuations for the future, and will state merely that the promenade picture appears to me the likeliest to please, and may be found suitable in certain specific instances.

The promenade picture, in comparison with the cabinet picture, is narrower, and therefore notably higher. A cabinet measures 95 mm. by 135 mm.; a promenade picture measures 76 mm. by 152 mm. The card mount of the latter is 168 by 100 millimetres. The proportion of height to breadth is, therefore, in a promenade picture, as 1 to 2. At first the promenade portrait appears too high, while the cabinet seems too broad.

There are certain proportions of height to breadth which make an exceptionally pleasing impression, not only in pictures, frames, but throughout art; in doorways, windows, facades, &c. This proportion is breadth to height, as height to the total of both. For instance, breadth = 3, height = 5, gives the proportion 3 : 5 = 5 : 8.* This is not perfectly correct, for instead of 8, it should be 5½, but these small variations are allowable. The fact is, the proportion 3 : 5 makes a very agreeable impression. A cabinet picture does not differ much from this proportion; it would conform better, however, if, instead of 95 mm. broad, it were but 95 mm.

The new promenade picture, on the other hand, is too high. The best proportion, according to the golden mean, would be 78 mm. broad, and 128 mm. high.

Unfortunately, but little attention has been given to the beauty standard, just as is the case in the cutting of our garments, and in the same way as it is impossible to argue down a new fashioned garment, no matter how foolish and ridiculous it may be, so we should be powerless to rob a picture of its popularity.

We may console ourselves with the thought that painters, on their part, trouble themselves very little about the golden mean. Angeli, of Vienna, has produced a series of magnificent whole-figure portraits, in which height to breadth is in the proportion of 2 to 1, and many of his pictures, which are in Berlin, come into my mind when I criticise the new promenade picture.

The old cabinet picture has one fault: it is too broad for standing figures that are slim. One is compelled, for this reason, to fill up the spaces on either side with furniture or ornament of some kind. This defect is not to be found in the promenade picture; it is, therefore, especially suited for slim female figures without crinolines, but with trains, and better still for full-length portraits of gentlemen. On the other hand, however, there is much empty space over the head which is very inadequately filled in. This space, too, has a bad effect upon the figure. The more room there is over the figure, the shorter the latter appears; while the more room there is beside the figure (as in the case of the cabinet picture), the slimmer does the model appear. When, therefore, a short, thick-set personage is to be photographed, it will be best to choose the cabinet *format*, while the new style may be employed to better advantage for slim figures which are not too tall. That promenade pictures are unsuitable for bust or three-quarter portraits, need scarcely be said.

In the few promenade pictures which have been placed before me as proofs, I have found one universal fault: the action of the foreground has been lost sight of. In cabinet pictures one is compelled, by reason of the deficiency of height, to cut off the foreground close to the feet of the model. This, unfortunately, has also been done in the case of the promenade pictures, where such a step was quite unnecessary.

The more foreground is left, the farther the figure recedes into the picture, and the more artistic it looks to the spectator. An aspect is thereby obtained which the

* This proportion is termed the golden mean. In larger sizes, when the photographer adopts any dimensions he likes, it is well to bear this proportion in mind.

painter has for some time past known how to profit by. By allowing a good deal of foreground, a short figure may be given height, for the head is then raised in the picture, and there is less empty space above. I should recommend photographers to take full-length portraits on 7 by 9 plates, and these they could cut down, according to the individual, into cabinet or promenade pictures.

ON THE MANIPULATION OF LARGE PLATES IN THE FIELD.

BY E. VILES.*

I must confess myself to be in a predicament, as I am asked to say something about the taking of the large direct photographs in the late exhibition, and really I have nothing to say. I do not like to begin thus; and yet I am afraid that the following particulars will be voted not a twice, but a many-times told tale.

With regard to the chemicals employed in producing the negatives, I have made no change from the various formulæ I gave last year in the paper I read before you; but the increase of size from 13 by 11 introduced some modifications in the manipulations. And here I would wish to remark, with reference to the question of direct photographs *versus* enlargements, that when the size of the picture does not much exceed the dimensions mentioned, a much better result can be secured by taking the negative direct than is possible by any enlarging process yet known; but when the size is beyond 24 by 18, then an enlargement becomes a necessity.

The difficulties attendant upon the taking large negatives by the wet collodion process are more in the bulk and weight of impedimenta required to be carried and moved about than in the manipulations themselves. When the knack has once been mastered, it is just as easy to coat a plate 20 by 16 as to coat one of a smaller size; and the same observation is equally true of the development and varnishing.

Last year I stated that I found an omnibus more convenient than a tent; but I discovered that a covered vehicle was not so well suited for these large plates. One great help to successful working is to have plenty of elbow-room. Some pride themselves upon being able to conduct their operations in the most limited space; but I believe it to be a mistake. The tent I used during last summer's campaign will be well enough known to you by the name of Smart's tent. It consists of a few light pieces of wood, which are quickly fitted together, and made rigid by sundry screws. When erected, it looks more like the stall of a peripatetic vendor of gingerbread than anything I can think of. Over this framework is thrown a covering of the twilled material generally used for dark tents, which is pinned down to the ground with iron skewers. From each upper corner of the tent hangs a cord, which is also secured to the ground with an iron pin. This prevents the tent from being blown over by the wind. My assistant puts this tent up and takes it down again in a very few minutes—say ten. This is done while I get the camera, &c., in order, or select a suitable point of view. When erected the tent forms a commodious and airy dark chamber, 7 ft. high, 3 ft. deep from front to back, and 5 ft. 6 in. wide. A mahogany board, hinged in the middle for portability's sake, goes all along the tent, giving a surface to work on of 5 ft. 6 in. by 2 ft. Above is a shelf, also hinged, which gives ample room for all the bottles, &c. Such a tent is easily made, is roomy, cool, and comfortable, and packs up into two comparatively small, and by no means heavy, packages.

From the tent we work in to the camera we work with seems a natural transition. Mine, made specially with a view to portability and careful usage, weighs about half a hundredweight. To shift such an instrument as this from

place to place in the ordinary way until the picture on the ground glass is suitable would be so laborious as to be a serious obstacle; but by the adoption of a simple expedient such fatigue and loss of time are quite done away with. There is an analogous difficulty in the use of a large telescope; and to obviate it a small telescope, called a finder, is fixed in such a position that the same object occupies the centre of the field of view in both instruments. Acting upon the idea this suggested, I took a 5 by 4 camera, and mounted it with a lens that embraced just the same amount of subject as the large one, the image on the ground glass of the small camera being a reduced facsimile of that on the large one. Thus provided, I could with great ease make several trials, until at length I had satisfied myself that I had fixed upon the very best point of view from which to take the picture.

This important matter decided, the tripod stand that carries the large camera is next fixed up, and the top accurately adjusted to a horizontal position by means of a spirit-level. A Stillman's camera resembles a closed book. In the lower part of it is cut a groove, into which a projection on the brass ring forming the tripod top accurately fits. The camera being lifted up is placed with great ease and certainty in the required position, and then clamped by means of the usual screw. Two pieces of brass are raised, the front and back of the camera fall like the covers of this book, and all is ready.

We come now to the preparation of the glass. In coating a plate the whole secret of success lies in keeping the pool of collodion quite circular, and as nearly as may be in the centre of the plate. If this is done, all is easy enough; but if, from careless pouring, the fluid is allowed to run into an oval or any irregular shape, then an imperfectly coated plate or a waste of material is inevitable. I hold the plate by means of a globe pneumatic plate-holder from which the handle has been removed. It is extremely convenient to put the collodion into a suitable pourer that will contain just the quantity necessary to flow the plate properly, and no more. For the size 20 by 16 I find two ounces is just sufficient; and this is the quantity I always pour on the plate, thus preventing any mistake by taking too much or too little, which is almost sure to occur when pouring from a larger quantity. Moreover there are obvious reasons why this method is best when immaculate plates are desired.

Development.—I prefer to develop by pouring on the developer in the usual way. I have tried the development-dishes recommended by Mr. England and others, but I found them messy and troublesome. There is really no more difficulty in applying a developer evenly to a large plate than there is in collodionising it. But as the weight of the sheet of glass is considerable, one's arm soon begins to cry out for rest; and so I avail myself of a little expedient devised by our friend Mr. B. J. Edwards, to which I gladly take this opportunity of calling attention. Take a good heavy pickle-jar, and into the neck of it insert a hollow india-rubber ball (those used in the game of lawn-tennis are just the thing); this forms a soft circular pad, on which the plate is instantly moved into any and every position with the greatest ease. On taking the plate from the dark slide, place the centre of it on the ball; support the nearest left-hand corner with a pneumatic holder, and apply the developer with a clean and even sweep. Nothing could be easier, and, thanks to this simple yet admirable contrivance, a large negative can be rocked or held just as easily as one of half-plate size.

I should not have ventured to occupy your time, and trouble you with these small points, were it not that had any one else written out these few hints I should have been saved much trouble in finding out the best and easiest way. Our manuals, numerous as they are, say scarcely anything about working large plates. I do not remember having seen it recommended that a duplicate negative of an away-from-home negative should always be

* Read before the Photographic Society of Great Britain.

taken; the extra trouble is comparatively nothing when the point of view is chosen, the object properly focused, and the camera in position. Accidents will happen; and the larger the negative the more liable it is to fracture in the pressure frame. The more distant the view, and the more difficulty there is found in securing a satisfactory result, the more important it is to take a duplicate. Moreover, perfect as the first negative may be, the chances are that the second one will, in some respect or other, turn out to be superior.

It is an unfortunate fact that every photographer meets with failures. My special trouble this season was the splitting off of the film during the final drying. What more exasperating source of failure is there than this? A large negative of a distant object is successfully taken, and every operation successfully carried out up to placing in rack to get dry; then to come next morning and find the film hanging down in ribbons is, to say the least of it, very trying to the patience. Fortunately I was able to trace out the delinquent and convict him on the clearest evidence. The collodion was guilty. I was very sorry for it, because of the many good qualities this sample possessed; it flowed over the plate in the most agreeable manner; it gave in the bath a splendid creamy film, which was of the utmost sensitiveness, and which, under the developer, densified admirably. But this one fault ruined all; and so, in spite of all his virtues, he had to go into banishment. What struck me as extraordinary was that, when employed upon small-sized plates, or even up to 13 by 11, it exhibited no tendency to this propensity. I thought at one time unequal drying was the cause; but it was not. I tried a substratum of albumen of different degrees of strength, and even supplemented that with a broad band of india-rubber varnish, but vainly; the film peeled off just the same; yet albumen proved to be the curative agent after all. After the final washing I applied the albumenising solution after the manner of collodion, worked it well over the plate, drained off the surplus, and put aside to dry. Negatives so treated did not split. Gum-water has been proposed for this purpose; but it is objectionable in many respects, as experience has proved. Gum is more hygroscopic than albumen; and plates that have been flowed with gum and then varnished are apt in time to crack all over the surface, more especially if they are exposed to fluctuations of temperature.

In conclusion, I wish to introduce to your notice a special form of spirit-level, which is particularly adapted for the purpose of levelling a camera; it is commercially known, I believe, as a plumber's level. At the upper part of it a second much smaller level is accurately fixed at right angles to the ordinary one. Its use is to show not only when a thing is horizontal, but when it is vertical. Applied to the focusing-screen it shows at once whether the ground glass occupies a position at right angles with the horizon. I wish also to mention that these large plates were all sensitized in a dipping-bath made of mahogany, and lined with pure sheet india-rubber, as described in my former paper. The silver solution and the india-rubber remain mutually unaffected; and the lightness and inexpensiveness of baths so made render them deserving of more notice and wider adoption than they have yet obtained.

ON BLACKENED SILVER CHLORIDE, AND ON SILVER SUBCHLORIDE.

Mons. E. VON BIBRA, in the *Deutschen Chemischen Gesellschaft*, says:—A long line of researches on the compounds of silver has finally led me to the conclusion that chloride of silver, when thoroughly blackened by light, cannot be considered as silver subchloride. On the other hand, I found that silver subchloride prepared by the action of

hydrochloric acid on silver subcitrate, gave, on analysis, as the mean of fifteen very concordant determinations:—

			Found.	Theory.
AgCl	...	...	80.22	79.95
Ag	...	...	19.78	20.05

These numbers agree with the formula Ag_2Cl_3 .

DIAGNOSIS BY MEANS OF PHOTOGRAPHY.

BY M. LE COMTE LODOVICO DE COURTEN.*

Dr. PHIPSON was, I believe, the first to point out in the *Moniteur de la Photographie*, 1st June, 1875, and afterwards M. G. Tiesandier, in his journal *La Nature*, related the circumstance, of an eruption of small-pox having been discovered by photography twenty-four hours before it was rendered visible to the eye.† The negative that was taken plainly showed a number of spots on the face, which were very similar to those seen upon a small-pox patient. A day afterwards, as we have said, the sitter was found by medical men to be suffering from small-pox.

Many journalists, little versed in the science of photographic optics, regard the circumstance mentioned as improbable; at the same time, there is little that is wonderful about it. In order that the small-pox spots should imprint themselves upon the cliché, it was necessary that they should possess a tint different to that of other portions of the skin. It would be absurd to suppose that the particular emanations of the small-pox could have been transmitted to the sensitive film through the medium of the lens. It is a question of actinism. There are some tints so delicate, so slightly marked, especially when it is a matter of minute spots, that they escape the most minute observation, and are lost in the surrounding tints. It is not said whether the spots in question were reproduced in the cliché in white or in black. In the first case they would have had a violet tint, and in the second a reddish colour, either of which would be perfectly lost in the half tone of the skin.

But what our vision will not alone reveal, the eye, aided by a deep blue glass, will demonstrate with a clearness before which all doubts vanish.

We have already published in the *Moniteur* a note upon the employment of a monochrome glass extinguishing all other rays but the blue. Since then we have extended its employment by applying it to the most important photographic uses.

Thus, in writing with a yellowish body pigment upon blue paper (the yellow colour must not be transparent, otherwise green is produced), you may produce markings which are altogether invisible to the naked eye, if the two tints are of equal intensity. But looked at through a blue glass you can read as easily as if the markings had been traced in black ink upon white paper. Many a time has this plan been the means of detecting stains and spots upon an engraving which would never have been seen by looking at the print simply with the naked eye.

In cases of doubt, in diseases of the skin, examination by means of a blue glass is a certain means of discovering clearly all those signs and marks which are the precursors of maladies. Our observations in this direction lead us to think, therefore, that there is nothing at all improbable in the case cited, where the small-pox marks, although invisible at the time to the eye, were perfectly apparent on the negative film. The same thing happens very often in photography, for we know that there are many markings of a delicate nature brought out upon the sensitive film which are not appreciable to less finely constituted tests.

* *Moniteur de la Photographie*.

† This, no doubt, is the same instance as that alluded to by Dr. Vogel the *Mittheilungen* some years ago.—Ed. P.N.

The Photographic News.

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COMPETITION, PRICES, AND BUSINESS MANAGEMENT.

THERE are few subjects more interesting to the professional photographer than the influence of competition on prices. Much bitterness has at times been evoked by unfair competition of some one who has opened a studio in a town or neighbourhood, where good or fairly moderate prices obtained, avowedly to push a "cheap trade." The aim of every professional photographer is, in one respect, unquestionably the same: that is, to secure the best possible income his business will yield, compatibly with certain conditions. The nature of these conditions will vary. With one a conscientious maintenance of the dignity of his art and his position as an artist will stand scarcely second to pecuniary gain; whilst with another no consideration beyond honesty in pushing a trade will have any weight. The important question for every class of portraitists is, which system pays best—a cheap pushing trade, with small profits and quick returns, or a business in which every picture, being the subject of personal care and skill, is charged at a rate which shall duly remunerate the artist? It is quite certain that low prices and high excellence are not compatible with each other, whilst without high excellence it is tolerably certain high prices cannot be maintained. Uniformity of prices, a thing which has at times been dreamed of, is clearly an impossibility, simply because uniformity of excellence is impossible. But whilst all cannot attain to the highest standard of excellence in work, and therefore cannot hope to secure the highest scale of prices, the truest wisdom will be manifested in a constant aim to secure excellence, and the steady maintenance of charges which will compensate for all the care bestowed. At the last Congress of the American United Association of Photographers this subject received considerable attention. We extract the following remarks in relation to it by Mr. Loomis, of Boston. He said:—

I know it has been said, and truly, let us give as many as we can for the dollar, or as many as we can for five dollars. Let us popularise it. That is all right, so far as we can do so and maintain the accuracy and the worth of the art, if I may so express it; but if we come down to auctioneers, every man bidding under every other man for the sake of the customer, and give him anything rather than something high, then it is, I think, that we are injuring our art. We have cut it down to a two-cent business too much. It ought to be elevated, and there is nothing in the world that will give it more respect than making it worth something, and charging for it.

A man who has gone down from five to four dollars, and from four to three, and from three to two, in order to get a number of customers rather than the value, has made a great mistake. They know it, and acknowledge it, but they have not got the manliness to stop. You must not use the argument that some do, "I cannot make quite as good work as you do, and therefore I do not ask quite

as much." There is another who says: "I have got an attic; it is up seven flights of stairs; I pay only fifty or twenty-five dollars a year for it; it does not require as much expense, consequently I will not charge as much." Better say, "If that man will distinguish himself up in the attic he can make even cripples go up after his work."

People talk about getting into popular avenues and popular streets, and that there is no business on side streets. I tell you, gentlemen and ladies, that I thank heaven that we have been joined by them; that your work will make people step upstairs, right lively too, if you make it worth going up for. If you go on the principle of underbidding your neighbour in price, getting them to substitute for art photography the apology for photography, you must expect the consequences—not only bankruptcy as an artist, but bankruptcy financially.

It is easy to see the causes of failure, if you will only look at it right; and you will find in your own locality, that the painstaking, the persevering, high-toned man, the artist, is the one who is holding his practice, and keeping his place. If you will look about you will find that the other places, seven-eighths, if not nine-tenths of them, have changed hands once in two years, on an average, and I may say, in some cases, once in six months. Now, I speak of this as an important thing. I do not suppose or expect we can close the matter up. Now, in reference to another matter, the club business.

Mr. President, the club business has hurt the art awfully. I want to enter my protest against the club business; and I am talking to photographers. What I mean is this. Each man, in the first place, is supposed to have a number of friends; he ought to have them. He says to these friends, "I will issue twenty tickets or ten tickets. I will give you one or two tickets." Perhaps it is a young lady or gentleman: "I will give you a tickets for one dozen photographs if you will sell the other eleven tickets, and give you pictures for three dollars a dozen, what I formerly charged five for; you shall have your card photographs, for all you sell, at three dollars a dozen; I shall charge five to others," and he gives this advantage to the person who gets up the club without seeing the consequences. His next door neighbour hears of it; he says he has agreed to give his five-dollar-pictures for three. I will give them for two, and in that way the business is hurt. Why, that would hurt any business. I say we should frown upon it, and do all we can to discourage it. There may be persons who may give their reasons for it. I say it lowers the dignity of our profession.

Some capital remarks on dealing with customers were made by Mr. Bogardus, President of the Association. Referring to the dignity of the profession, he suggested that it would be conserved best by the photographer maintaining a patient self-respect. He said:—

Now, the dignity of the profession. There are many instances in which we hardly know what to do. We try to preserve our dignity: and our tempers both. When a lady comes to me, and tells me she wants a picture, and that she has been to Fredericks' and Gurney's, and all of them have given her a crooked mouth, and she ain't a-going to have any more taken there, I feel it my duty to tell her I cannot take her a picture without taking her just as she is. There is no use of our attempting to straighten the crooked mouth. I tell her my cameras won't lie; if they did, I would throw them out of the window. I feel provoked when they come and ask such impossibilities.

Another lady came with her daughter most terribly cross-eyed, and she said if I would examine her daughter's eyes closely, I would see a slight cast in one eye. I saw it when the girl came upstairs. I don't know why it was, but in the good old Daguerreotype times, I used to know, when a lady came upstairs, how she would trouble me in making her picture; and when the head came up, I was looking for good subjects to come up. I was always afraid it was a bad one. We did not retouch in those old times. There are some cases in which it is impossible for you to preserve your dignity. They will tell me they have visited several places, and one picture is just as bad as the other. It may be the last photographer has taken the wrong side of the lady's face. There are thousands of pictures that would be improved if only the other side of the face were taken. You must always study your face. That is the future of photography. The manipulating is of course difficult, but we have mastered that to a great extent, and we have now got to learn to study faces, and find out the best side, the best view of their face. And that is the secret of some of your crack photographers. That is why they take such good photographs. Now, they have gained their reputation by knowing which side of the lady's face shall be the best. Many a time I have made the lady take her hair all down, so as to get the best side of the face, simply because it was much better than the other. They will do it when they find that they are going to get a better picture that way.

Now, about keeping your temper. A gentleman has just retired from the photographic business, in Boston, that I heard this anecdote about. I tell it because it will do you good and make you try to suit your customers regardless of the trouble. A gentleman came in with an eleven by fourteen group of five. He said it was one

of the most elegant groups that he ever saw—a group of five on an eleven by fourteen plate. The customer says, "We are not quite satisfied with this group; we wish you would take it over again." "Certainly: come in, by all means; come and sit again," said he; and the customer went out with the view of bringing his family again. This visiting photographer says, "Do you take as good a picture as that over again without charge?" "Why," said he, "that is the second one I have taken, and I am going to take it over again; that will satisfy my customer, and he will come again." That man has retired with 150,000 dollars. I would like to see any other photographer who has done it. How has he done it? He has done it by suiting his customers, regardless of trouble, expense, and time. Oftentimes it is hard work. I have to bite my lips many times to keep my temper down; but, I will tell you, it pays.

A while ago an old gentleman came to New York with a grand-child. They took the child to a photographer to have its picture taken—a man whose name they had heard mentioned a great deal. The child was scared, and would not sit. They came back to the hotel and inquired where they should go. Another thing I will tell you. He had paid the price for a dozen cards, and the child would not sit. When he went downstairs he wanted his money back. They would not give it to him. He did not like that. He came finally to my place. He said the other place was like a circus, pay before you went in. They had come over to my place thinking they would try again to get the child's picture. Whether we were very busily employed that day or not I don't know, but we did get the child's picture right away. We kept it in good humour, and the child's picture was taken; and the old gentleman said to me he wanted a large picture of himself, saying, "I have been waiting a good many years to get good-looking, and I guess I had better have it taken now," and he told me he would be very glad to have it done at once. I took down and showed him my life-size seventeen by twenty crayons, and before I had completed his work got a bill of 1,005 dollars from him. That was by just keeping in good humour; if I had not I never would have got a cent. He gave me his cheque for 1,005 dollars, and that was for taking babies. I know photographers don't like it, but take the average through the year, we have less trouble with them than with the older ones. If you succeed in getting it the first, second, or third time, you will make it; and it pays to take the babies. If you don't take the babies, you don't get the mothers; and if you don't get the mothers, you don't get the fathers. So you may make up your mind it pays to take the babies, and keep in good humour, and do it all the time.

METEOROLOGICAL REPORT SHOWING THE DAILY VARIATIONS IN THE QUANTITY OF LIGHT RADIATED FROM THE SOUTHERN SKY OF BLACKPOOL, IN LANCASHIRE.

BY D. WINSTANLEY, F.R.A.S.

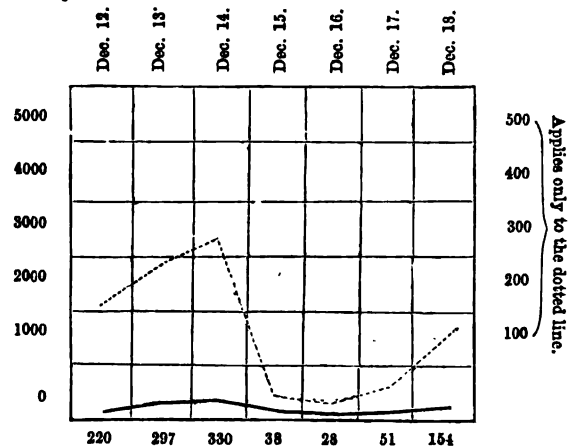
THE past week has been extremely dark, the daily average of light being only 159 chemical units, or 123 units less than the darkest week I have previously recorded, a circumstance which shows the probable worthlessness of those opinions I had formed from mere casual observation.

I notice from your last week's issue that at a recent meeting of the Photographic Society of Great Britain, Mr. Glaisher, in alluding to my reports, objected, in the first place, to their being called "meteorological;" affirmed, in the second, that they were obtained by Roscoe's method; and expressed regret, in the third, that no simple and reliable photometer had thus far been devised.

Although the light, or rather the force, of certain portions of the spectrum is that of which I make my measurements, there can be no doubt that the sudden and violent variations in its daily aggregate are, after all, effects of which atmospheric obscuration is the cause. In the majority of what are called "meteorological observations," daily and even hourly ocular estimates are made of the quantity of visible obscuration in the atmosphere, and these are placed on record along with the readings of the barometer and thermometer in the tabular form under the heading "Meteorological Observations." I am at a loss to see why my chemical and instrumental measurements of atmospheric opacity should be given under any other generic name than that applied to measurements of that same opacity obtained by ocular means, and without the manifest advantages of instrumental aid. It is, however, a matter of indifference to me by what appellation my observations may be described, and I am quite willing to abandon the

term "meteorological" when it has been shown that the word is misapplied.

As for the method I employ being that of Roscoe, I presume, if this is so, his appliances and means will be found sufficient to effect the measurements which I make. To the best of my knowledge and belief this is not the case.* Roscoe's observations had for their object the momentary measurement of "intensity;" mine the actual measurement of "quantity." Surely a distinction should be made between the one thing and the other. Is there no difference between the speed at which a train at any given moment may happen to be travelling, and the distance it may traverse in a day? The former I should describe as the "intensity" of its movement, the latter as the aggregate or quantity of motion. As for the simplicity of means, I will not discuss the matter now. That can best be judged of when my own have been described.



Correspondence.

MOUNTAIN FORM AND FALSE PERSPECTIVE.

DEAR SIR,—When I sat down last week, full of amusement, to write you a dozen lines or so about the slips you had just allowed your coadjutors to make, I did not expect you to extenuate, far less homologate, the chief offence. Of course, I know you will be fancying that I do not see the subject from your point of view. I do see from your point of view, but I see differently. Let us understand each other, however.

You say that "false perspective" is "given by the misuse of lenses of short focus, by which a mole-hill in the foreground is exaggerated to a towering mountain," &c. Now I will assume that the mole-hill, as well as the mountain, is in reasonable focus—for without assuming the focus to be correct we cannot argue. Throw the subject out of focus, and you will not even find bad perspective in it. In fact, it has no perspective at all; "look and see." Therefore I maintain that although the mole-heap look a veritable Schichallion, and the mountain a midge, there is nothing wrong with the perspective. Of course, it would look very unpleasant—only unpleasant—not false. However, you talk about the misuse of lenses of short focus. Give us an instance. But, mark you, if you say that the mole-hill was out of focus, I reiterate, if so, the law of perspective is out of court.

Suppose an artist was painting a landscape containing great distance, and continuing the subject to his very feet, and had drawn the whole correctly, would you say the per-

* Mr. Glaisher's remarks had reference to the mode, or rather the material, employed in measuring the light, the Editor having informed him that, so far as he believed, sensitive paper was employed in estimating the light as in Roscoe's observations.—Ed.

spective was untrue or false? I say it would be nothing of the kind; but it would look unpleasant, and the foreground would look outrageously large, and the distant mountains molehills, if you will; but it would not be a false perspective. You would call this—What? Misuse of the artist's eyesight? Undoubtedly; but there is something more; but not false perspective.

There is still another, and even more tantalizing view of the subject, accepted, not only by the public, but also by writers, from Ruskin downward. It seems a general fancy that the sizes of mountains in photographs are smaller than they ought to be, although, in any moment (on the spot, of course), the truth or untruth of the idea could be tested by the holding out of a pencil or scrap of paper. Of course there is, at times, atmospheric illusion; but photography, or correct draughtsmanship, has nothing to do with that, belonging, as it does, to colour. I fancy that part of the secret lies in most people being unable to realize the relative size of objects when diminished to a few feet or inches on canvas or paper. The law of diminution, here, seems even puzzling to our greatest art critic. In Vol. IV. of "Modern Painters," when treating of "Turnerian Topography," he relates that one day he sketched the towers of the Swiss Fribourg, and the next he Daguerretyped them, both of which he engraves to illustrate the accepted orthodox ideas on this subject. In that, from the sketch, you have a wall wilfully exaggerated in the outline, which appears in the other engraving all but straight; and after telling us that "this unexaggerated statement, with all its details properly painted, would not only be the more right, but infinitely grander, of the two," he goes on to say, "the notabest thing in the town of Fribourg is, that all its walls have flexible spines, and creep up and down the precipices more in the manner of cats than walls . . . so that the hasty sketch expressing this, has a certain veracity wanting altogether in the Daguerreotype."

Now I fancy that this delusion about the diminution of mountains and form in photographs receives its support mainly from the almost habitual and wilful exaggeration of artists and art critics. I do not wish at present to say a word against such ideas of art, but will content myself with pointing out that this kind of "veracity" is a capital illustration of the parson's text in Tennyson:—

"That a lie which is half a truth is ever the blackest of lies,
That a lie which is all a lie may be met and fought with outright;
But a lie which is part of a truth is a harder matter to fight."

Yours, &c.,
Wemyssfield, Kirkcaldy.

HANSIE MONDAY.

[The subject is far too wide, and involves too many side issues, to be discussed in a brief note to our correspondent's letter; and we can but briefly remark, first, that the objects are in false perspective which present a false idea of size and proportion to the eye and mind; second, that a photograph taken with a wide angle lens of short focus, say an eight-inch picture, with a lens of four or five inches focus (and we have seen such), presents to the eye such a false impression of size and proportion. We recently saw a photograph of the Houses of Parliament, taken from the opposite side of the Thames, with a lens of short focus. If we had not known the scene, we should have believed the Thames to have been miles instead of fathoms in width. This was something other than unpleasant—it was untrue. We are, of course, in all cases assuming good focus. We do not enter into discussion of the artist's drawing foreground-images close up to him; but there the immobility of the eye must be enforced, which would seriously limit the range of correct drawing. Neither can we enter into the vague impression of many persons as to the accuracy of correct drawing when deprived of the glamour of atmosphere, colour, and association. Without entering into the mathematical discussion, we may suggest that a camera picture presents a correct rendering of a view to the eye only when the eye occupies the same relation to the picture which the

lens did to the plane of delineation, a condition rendered all but impossible, and certainly never adopted, when extremely short-focussed lenses have been employed.—Ed.]

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

Annual Dinner.

THE annual dinner of the above was held on Saturday at Anderton's Hotel, when the chair was occupied by the president of the Society, the Rev. F. F. STATHAM, B.A., a large number of members and friends being present. After the customary loyal toasts, the CHAIRMAN gave "Prosperity to the South London Photographic Society." In so doing, he observed that the Society, during the past year, had done good work in the cause of photography. In nine months seventeen papers had been read, all of which had led to most interesting discussions, while two or three served to indicate material progress in the future. The technical meeting had even been more successful than its predecessors, and promised to bring forth good fruit. He hoped the members—especially the younger members—would be encouraged to come forward with papers, and add to the usefulness of the Society. He did not think long papers were necessary; indeed, short ones, or even a few hints, were often more valuable, for he might remind them that many important scientific discoveries had been initiated by hints thrown out in the course of conversation between scientific men. The Society had, he felt, during the year justified its *raison d'être*. It had not only done good work, but it was working in the greatest harmony with the Photographic Society of Great Britain, towards which it played a most useful part of educating, as it were, many who afterwards became useful members of the older society. In conclusion, the Chairman coupled the toast with the name of Mr. E. COCKING, the new secretary.

Mr. E. COCKING, after referring to the many times he had had the honour of responding to the toast, said the Society was now in a more prosperous condition than it had been for some time past. Two or three years back the work of the Society was not so extended, nor so interesting, as it should have been; the institution of the technical exhibition had, however, done much to remove this, while an accession of new members had also given a fresh life which was most valuable. The meetings where the magic lantern had been exhibited were of the most successful nature, and, indeed, it seemed to him that the promotion of practical knowledge and the encouragement of good feeling among photographers constituted the mission of the Society, and as long as these principles were maintained, so long would the Society exist. Mr. Cocking then referred to a feeling he had entertained that the time had come when he should resign the office of secretary. He should be very sorry to think that by continuing to hold the position he was depriving any one who had a desire to serve the Society in that capacity, and he had thought of resigning the post before the last annual meeting. However, when he came to think over the matter, and of the pleasure which he experienced in discharging his duties, he could not bring himself to part with them. (Applause.) In conclusion, Mr. Cocking referred to the harmony and social feeling which had always existed in the Society, and trusted both would long continue.

The CHAIRMAN then gave the toast of "Photographic Art-Science." In regard to its art aspect he could not but think that the discovery of photography had tended greatly to cement our home affections. There was scarcely a family that was not enabled by its means to retain a remembrance not only of those who were separated from them in distant parts of the world, but also of those who had been taken away by death. For this reason the humblest photographer who took his shilling positive ought not to be despised, as he was the means of giving pleasure and comfort to thousands, though his work might not be of the very highest quality. It was also of great use in handing down a faithful record of the features of great men, and hence its value could not be too highly estimated. In respect to the relation of photography to science, he did not hesitate to say there was not a science which did not owe something to photography, and what was most singular was, that for any benefit which the latter received from science, it repaid a thousandfold in return.

Mr. VALENTINE BLANCHARD, whose name was associated in the toast, said it gave him some feeling of sadness when he thought that the great man who had two or three years since responded to the toast was now no more. Rejlander, who, of all men, had laboured earnestly to elevate the art of photography in the eyes of

mankind, and in this respect stood bright as a beacon light before his brethren, was gone, and there was no one left in England to fill the blank. When he looked at the possibilities of the art, he must confess that after twenty years' labour he found it more circumscribed than in his enthusiasm of twenty years since he had thought it to be. Simplicity, after all, was the best thing to aim at, though, perhaps, the hardest to attain. The Chairman, in his reference to the usefulness of photography in rendering the features of great men, had struck a key-note, and he (Mr. Blanchard) felt it so strongly that he could not help protesting against the corrupt practice of retouching. Each one owed it to the art to work earnestly according to his degree as a light to others, and if all lent themselves to the practice of retouching, what became of truth? (Hear hear.) He would therefore say that while it was quite possible for the artist to supplement the occasional defects of a poor light or bad sitting, to go any further than this—to distort and vilify—no one had a right (applause).

The CHAIRMAN then gave the toast of "Amateur Photography," humorously alluding to the trials endured by sitters at the hands of their photographic friends in the early days of the art. In the South London Society there were many amateurs, and to them the Society of their professional brethren was especially useful. In no single instance, where information on any point had been asked for by the amateur, had it ever been withheld by the professional members.

Mr. NESBITT, who responded, referred to the fact that although he had practised photography for some twenty-three years, the art for him had never lost its charm.

Mr. SPILLER then proposed the health of the Visitors, to which Mr. Tom Archer replied, alluding in the course of his remarks to the assistance which photography gave to wood engraving, especially in respect to illustrated periodicals.

The CHAIRMAN then proposed the health of the "Press," which was acknowledged by Mr. G. Wharton Simpson, Mr. William Sawyer, Mr. John Proctor, and Mr. C. E. Pearce.

The remaining toasts were the health of the Chairman (proposed in kindly and appropriate terms by Mr. Werge), the Vice-Presidents (by the Chairman, and acknowledged by Mr. G. Wharton Simpson and Mr. Spiller), and "Absent Friends."

The proceedings were enlivened by some excellent songs and recitations, and an exceedingly pleasant evening was spent.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THIS society held its first popular meeting of the season in Queen Street Hall, on the evening of Wednesday, the 16th inst. The exhibition consisted of a miscellaneous series of transparencies by members of the society, and a descriptive lecture by Dr. John Nicol.

The lecturer, who appeared on the platform seven minutes past the time mentioned on the tickets, began by saying that he sympathized to a certain extent with the impatience of the audience which had been manifested during the last five minutes; he, however, thought he was entitled to a measure of sympathy in return. They would easily understand that it was extremely unpleasant, after the exhibition began, to be interrupted by those who were in the habit of coming in late, and that he had waited for seven minutes simply to give them an opportunity of taking their places; and he assured them that in future if they would make a point of being in their seats by eight o'clock, he would commence punctually at that hour. He then stated that the exhibition about to commence was in some respects different from that which generally formed the subject of the popular evening, in so far as that there was on this occasion no connected series of pictures, and consequently no connected story to tell. The committee had thought it advisable to give members an opportunity of exhibiting their pictures, and for that purpose had invited those who had transparencies to send them in to him. Only seven, however, had responded to the invitation; but what was lacking in number of exhibitors had been fully made up by the number of pictures that the seven had sent. And although the collection was necessarily of a miscellaneous nature, he had no doubt that the exhibition would be satisfactory. The hall was then darkened, and a series of very fine portraits of children, singly and in groups, some with finely managed floral borders, and also a few of the city Arabs in all their wretchedness, and of the same practising trades after they had been trained at the ragged school, the work of Messrs. Ross and Pringle, were shown on the screen. These were followed by a number of well chosen pictures of several abbies, &c., in Dumfriesshire, photographed by Mr. Murray Gartshore, of Ravelston. These were followed by a series of horse and cattle pictures, by

Mr. Foster, of Coldstream, who, the lecturer said, fairly divided the honours with Mr. Ross in having attained the highest possible degree of excellence in two such difficult, though very different, branches of the photographic art. The pictures, of which there were a large number, were arranged so as to give an idea of the nature and succession of the work on a farm, and their exhibition received much well merited applause. From the works of Mr. Foster the lecturer passed to those of Mr. Mattheson, who, he said, afforded another illustration of the frequently quoted observation that "the busiest man has most leisure." Mr. Mattheson, he said, although at the head of a rather exacting business, nevertheless found time, not only to snatch an occasional hour to photograph, as would be seen, some of the buildings that were fast being replaced by more modern structures, but also to go, camera in hand, to almost all parts of the country, and bring back pleasant memorials in the shape of excellent photographs. The collection included fine bits of both the old and new town, rustic cottages and quaint corners in Curry, Skydow, &c., and architectural views in Peebleshire, including the houses of Forbes Mackenzie at Portmore, and Mr. Tenant of the Glen. Dr. Nicol then introduced a number of his own pictures, principally views in and about Yetholin and the capital and head quarters of the gipsies. He said that in common with most people he had long had a wish to visit Yetholin, but until this season had not had an opportunity of doing so. After describing the journey from Kelso to Yetholin, and the comfort of the inn kept by Mrs. McCallum, he showed a number of pictures illustrating the appearance of the village and the kind of houses which the tribe occupies; finishing with the Royal Palace, and a portrait of Queen Esther herself. The lecturer here gave a humorous description of his interview with the Queen, whom he described as a hale hearty woman of eighty-two, who would drink nothing stronger than tea, but had no objection to join him in a smoke, as did also the Princess Royal, who happened to be on a visit to Yetholin at the time. He described the "Crown Jewels," consisting of a large number of rings, some of them of considerable value, which had been, in most cases, taken off the fingers of distinguished visitors, and presented to her; and also the "State Papers," which are a series of letters written to the Queen by a considerable number of earls, lords, ladies, and a host of people of lower importance. The portrait of the Queen, and also several views of Kelso, were the work of Mr. Macintosh, photographer there, and were of excellent quality. The exhibition concluded with a number of recent pictures by Mr. Wilson, of Aberdeen, consisting mainly of instantaneous views on Highland lochs and the Thames.

The audience was, as usual, very large, and the exhibition highly successful, both pictures and description, especially where interspersed with appropriate anecdotes, eliciting considerable applause.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held at the Memorial Hall, on Thursday evening, the 9th inst., Mr. ALFRED BROTHERS, F.R.A.S., Vice-President, in the chair.

The CHAIRMAN read the following letter from the Rev. Canon Beechey, M.A., Ex-President, and handed round a number of emulsion negative, and Canon Beechey's mountain camera fitted with the split sunshade:—

"Hilgay Rectory, Dec. 7th, 1875.

"DEAR MR. ADIN,—I have requested Mr. Taylor to send you for the meeting on Thursday—1. The negatives of wet-plate quality. 2. The fine split sunshade on my little mountain camera. 3. Two negatives with paper attached which exemplified its working. I ask you to hold the one of the rectory up against a strong light, and see if you can detect the slightest trace of the sunshade, although the trees and grass were exposed three minutes, whilst the house had only thirty seconds. It may be interesting to the members if I add a few remarks on the method of using the sunshade, and also on a subject closely connected with it, viz., blurring.

"The fine little shutters of the sunshade are, as you see, quite independent of each other—each one may be of any height and any distance from the lens; of course you would lower the one which would best shade a too-light object. In the case of a waterfall, like that in the Fairy Glen, Botlwa-y-Coed, the centre shutter would be alone required, and you would lower it until the entire opening and fall were shaded. Five minutes with a very sensitive plate would not be too long an exposure for the green, dark, and gloomy rocks on either side of it: five seconds would be sufficient for the sky and fall, whereby all the transparency of the water would be secured, and all the details of the shrubs and stones be equally rendered. But, suppose the fall were the Swallow-tail-

fall, Bettws, you would then probably put down two in the middle, so as to shade the fall pretty low down; then you would lower those on either side of the centre, so as to shade the sky to the level of the top of the fall. You need not be very particular as to their fitting on, though, of course, the nearer the better. The two shutters on the outside would be up to allow of long exposure on the trees above the fall. All being arranged to your mind pull the little trigger and shut off the picture, screw the shutters tight in position, put in your dark slide, expose from three to five minutes or less, and then lift all the shade as usual by the milled head on the left hand. Continue the exposure of the whole picture five seconds or so, and shut off by the trigger again.

"It will rarely happen that any other arrangement of the sunshades is necessary. But supposing you were taking Fingal's Cave, and wished to shade the sea and rocks so as to give the dark roof and interior a very long exposure, by moving the shade round a quarter turn you may quite conceal the lower half, while the upper is exposed; or, if a waterfall be oblique, the angle may easily be adapted to suit it. You will also notice that the width of space shaded by a single shutter depends on the closeness of that shutter to the lens, so that very often one shutter may be made to cover as much as two, only, of course, the shadow will come lower down; but, as each shutter is longer than the outer diameter of the lens, even that is capable of much adjustment.

"Now, as to blurring. I have not discontinued the experiments referred to a year ago in the Journal. These experiments and the use of the split sunshade have made me almost positive that what is commonly called 'blurring' is not caused by reflection from the back of the glass, but simply by over-exposure of a very bright part, whilst the darker is proceeding. A bright window in a dark church will blur even if you do back the plate. The ruined arch against the sky in the Castle Acre Ruin you will find blurred in the perfect negative, but quite free from it in the one where sunshade was used, but not lifted high enough at last. You may almost prove this by the fact that as you develop, the blurring does not appear at first. The arch or windows will come out beautifully sharp and clear, and if you could stop there, there would be no blurring. As, however, you proceed to force out the dark detail your arch blurs; just as a very much over-exposed plate would blur all over. The use of the sunshade here will be very evident.

"But let me tell you the somewhat singular result of my recent experiment with silver-backed plates. I wish I could send you a silvered plate before it is coated, that you might see what beautiful looking-glass, the real silver deposit on a plate by Liebig's process makes. Well, I tried several times this experiment:—I prepared three plates at the same time, with the same emulsion and preservative. A was backed with brilliant silver; B was backed with non-actinic red ochre; C was left unbacked. These plates were exposed for the same time on a blurring object, viz., the dark north side of a church with the bright sky above and behind it. The exposure was for one minute. The result was very remarkable. In A the ridge tiles were a very little blurred; in B and C they were not. But A was, at least, three times as dense a picture as B, and B was also less dense than C. In A all the detail was fully out, every stone in the dark wall was visible, and yet even the vane and flagstaff on the tower were as sharp as thread, though slightly fogged, simply showing over-exposure. I will try a few more experiments yet to make quite sure; but I am almost able to say positively that non-actinic backing prevents blurring only by making a plate much less sensitive, so requiring much longer exposure. In a second experiment I gave the backed plate three times as long exposure as the silvered plate, and still the silvered plate was far more dense, sharp, and full of detail. I attribute this result to the direct perpendicular reflection of every bright point on the white surface of the film from the silvered back on to the back of the film. By this means the back of the film has the picture projected upon it at the same times as the front; whilst from the non-actinic backing the front of the film is alone affected, even if the yellow reflection from the back does not actually retard it. I believe that astronomical photographs, such as the transit of Venus, if taken on silvered plates would require only half the exposure they do now, and would be quite as sharp and more dense. I think it is the surface of the film which takes the impression, and with silvered backs both surfaces are impressed. It is quite possible that with very transparent films a double reflection might ensue, particularly near the extremes of the picture, but I have never been able to trace the least appearance of one.

"As your notice says you have no paper for the evening I send you this, if only to afford you a subject for discussion.—Your old faithful Ex. P. and V. P. "S. VINCENT BEECHY."

Mr. JAMES YOUNG exhibited half-a-dozen small lenses of different foci, mounted for insertion between the lenses of a doublet for the purpose of altering its focus. Also, a small dropping tube, made by putting an ordinary vulcanized rubber teat on the end of a bit of glass tubing drawn out at the end.

Mr. CHILTON exhibited some half-dozen negatives on Liver-

pool emulsion plates. These were considered better than those sent by Canon Beechey.

Mr. PARKINSON exhibited a rude-looking, but most efficient holder for large plates.

Mr. D. YOUNG exhibited some slides by Mr. Dixon, of London.—Subject:—"The Arctic Expedition Vessels and Crews."

Mr. POLLITT and Mr. LEVER had each brought Silber and fountain lamps, and the members adjourned to the lantern room to test these lamps against the sciopticon. The lantern in which the lamps were used and the sciopticon were mounted together, at the same distance from the screen, and gave similarly-sized discs. There was no mistake about the superiority of the sciopticon over all competitors yet tried.

After the usual votes the meeting was adjourned.

PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.*

A MEETING of this Society was held October 2nd, Mr. HENRY J. NEWTON, President, in the chair. The minutes of the September and October meetings were read and approved.

After some approving comments from members on Mr. Newton's emulsion plates,

The PRESIDENT, in a reply to a question of the Secretary, said it was a most difficult thing to intensify a dry plate after fogging; but he had succeeded in doing this, and the method he adopted was as follows:—He made three stock solutions.

No. 1.

Water ...	...	...	...	...	8 ounces
Iodine ...	...	...	...	...	20 grains

Add sufficient iodide of ammonium to dissolve the iodine in the water, after which add one ounce of hydrochloric acid.

No. 2.

Water ...	...	...	...	...	6 ounces
Citric acid ...	...	...	...	...	80 "
Nitrate of silver ...	...	...	...	...	80 grains

No. 3.

Water ...	...	...	...	...	6 ounces
Protosulphate of iron ...	...	...	...	...	30 grains
Citric acid ...	...	...	...	...	80 ounces

A plate 8 by 10 is used. After the plate is fixed and washed, take about three-fourths of an ounce of water, and enough of the bromide to make it apparently set. When a slight veil appears on the surface, which may take from thirty to fifty seconds, this will intensify it to a sufficient extent. The Secretary inquired if, when this is done, it would not be colourless.

The PRESIDENT answered if it is fixed in the hypo it is taken all out, when the colour is discharged from the solution.

Of No. 8, pour about three-fourths of an ounce, and from No. 2 pour over the plate sufficient to flow all over without much excess, and keep it moving so that the action is even and uniform, say from thirty to forty seconds. Then pour it into No. 3. It is then perfectly free, clear, and brilliant as anything can be. He tried this on several occasions, and it produced extraordinary results and full of detail. Before putting on the pyrogallie acid, the picture rushes out and gives a very curious effect, so that he thought he had succeeded in developing with iron. But he had no opportunity to satisfy himself fully on this point; all he could say is that it works very fine. Mr. Russell, to whom he showed them to-day, admired them very much. After washing the plates, set them up to dry.

The rationale of the theory seems to be that a certain portion of the silver is converted into the iodide of silver.

Thus it will be seen how readily an iodide can be converted into a chloride; but put it into the hyposulphite of soda, and the bromide will be dissolved very quick, and the iodide will dissolve very slow. There are some very interesting experiments on the action of light upon bromide. It has been supposed that a bromide is more sensitive to light than the iodide. If the iodide and bromide of silver are exposed to light, a similar result will be attained. He could not see that the bromide was at all more sensitive than the iodide; in the weak lights it is weak; but a small quantity of the iodide, if put into the bromide, is seen almost instantly; one grain is sufficient. The action of the light upon a sensitive film so constructed is entirely different from the simple iodide. Now it is just the same with a bromide film, a trace of iodide will increase the sensitiveness in the weak lines.

Mr. Carey Lea's process is said to increase the sensitiveness four times; but with his (the President's) process the emulsion would work in half the time. But with the alkaline develop-

ment he failed to get the intense lines. He showed some negatives made that way some time since; but the extra time saved was not compensation enough for the extra time taken in developing, so he abandoned it; but in testing this method he found that a quarter to an eighth of a grain gave the same results. Then he tried the iodide in water, and washed the plate thoroughly; flowing the plate half, increased the sensitiveness half; but still it would develop thin, converting a very small part of the iodide into a bromide; he had to strengthen with the pyro. He exposed the plates from ten to twenty seconds in the spring, and at this season he allows thirty seconds.

Mr. D. C. CHAPMAN said that within the past week he made an emulsion, and had used some iodized collodion (such as is used in ordinary photography) to take up the excess of silver in the emulsion.

He prepared the emulsion in the same manner as in 1867 (with the exception of the iodized collodion), and which was published at that time. But he would repeat it for the benefit of those present—

Ether ...	...	...	...	1 ounce
Alcohol ...	...	...	...	1 drachm
Cotton ...	...	...	...	12 grains
Bromide of cadmium ...	...	...	...	24 "

This he called the bromized collodion. Then he took one ounce of alcohol, nitrate of silver thirty grains, dissolve by slightly warming to a blood heat, or a little more. The silvered alcohol is then added to the bromized collodion in small quantities, and shaken well at each addition of the silvered alcohol. Sufficient of the silvered alcohol is added to the bromized collodion, so that the silver will be slightly in excess, which he determines by pouring a small portion of the emulsion into water, and washing it by shaking, then by adding some chloride of sodium to the water. It will readily be seen whether there is any silver in the water or not. Then after standing one hour, the iodized collodion spoken of is then added, which takes up the free silver, giving a small quantity of the iodide of silver. In the emulsion he uses about one ounce in six; that is sufficient to take up the excess of silver, so that by drying the washing and chloride again he found no indication of an excess of silver in the emulsion. This emulsion appears to develop more like the ordinary negative, giving a greyer negative than the bromide alone, having more the appearance of wet plates.

He always washes his plates before putting them in the preservative; he uses only tannin for such. These first experiments were quite satisfactory, but he would not promise that they will be so again, as he had been deceived so many times with emulsions, and will not pronounce them good until he had tried several more experiments to see if they will continue to be as stated.

The PRESIDENT remarked that in this process the trouble would be to know when there is a sufficient amount of silver in the solution. The union of silver in this case is very slow; it goes on increasing, and grows thicker and thicker for some time. Now in making an emulsion in Mr. Chapman's way, after washing out there will be silver that has not combined with the bromide. Bromine is peculiar; as bromine it unites with all metals, and some of them so forcibly as to set them on fire; it takes to silver quite readily, and for that reason he would be rather suspicious that even if there was silver in the wash there would not be bromide enough to take it up.

Mr. CHAPMAN answered that if a drachm of silver is put in at a time and shaken well, he never had a reaction; it seems to be taken up immediately. Any silver left after that is taken up by the iodized collodion.

The SECRETARY remarked that Mr. Chapman's process seemed to be a safe one, as it left no free silver to produce fog. What is wanted is a standard solution, so that a uniform system of working could be had.

The PRESIDENT said he did not want to find fault with Mr. Chapman's process, but it seemed to him that before he was aware of it there would be an excess of silver in the solution. A bromide solution with the bromide in excess will not keep; it will with the chloride, but not with the silver. He had some now five months old, which is very brilliant, and increases with age. It is important to have an emulsion that will keep, and if it changes, to have it change for the better.

Dr. M. N. MILLER stated that the plates prepared by the process of M. Carey Lea were good, but the negatives

were thin, and he could not get them up to a decent printing negative. When made very sensitive they are thin. As to preservatives, there seemed to be a great variety of them.

There is Mr. Chapman's organizer twenty grains to the ounce, and again the President's twelve ounces. Now certainly here is a wide range. Is there not a point between these where the best results can be had? He did not succeed very well with the tannin.

Mr. CHAPMAN said he could get more vigour in a strong tannin solution than with a weak one. With his bromide plates one will develop strong and vigorous, while the other will lack these qualities.

The PRESIDENT remarked that one great object with him was to prevent too great an intensity. Any one who is not practised in this respect will be apt to get into trouble. When he went to the country last summer he took plates with him prepared with tannin, as he was not sure that the plates prepared by the new method would keep, so he used the old preservation, and when he came to expose them, he found they were very insensitive. He had to expose them five minutes. They made good negatives, but took long exposure.

Mr. P. B. WELT exhibited some fine specimens of stereoscopic pictures taken by the ordinary formula, one ounce of the protosulphate of iron, sixteen ounces of water, two ounces of No. 8 acetic acid. The re-development is made with the iron after washing, flowing the silver on the plate. All the details were got with the cyanide of potassium. The groups were given about five seconds' exposure. The strength of the collodion bath is fifty.

Mr. BIERSTADT said he made some experiments with the papyroxylin. The emulsion was prepared according to Mr. Newton's process. In one case he left the silver in excess for twenty-four hours, and then added a trace of the iodide, and with this he got a fine picture, but a little foggy, and in the experiment with Hance's "Delicate Cream Cotton," and more chloride, there was no fog, and a little better picture. He then added the iodide, which did not make as strong a picture as the others, but none worked so perfectly as the papyroxylin. The imported emulsion does not work as clearly as could be desired. In regard to developing, his brother says that he uses the developer as hot as he can bear his hand in it, and he also puts the ammonia on hot. The carbonate of ammonia in a bottle is placed in hot water and then used. After some twenty plates have been used, the solution will become quite cool. The preservative was coffee with a little candy and gum arabic, as usually prepared.

Dr. MILLER thought that at 212 degrees of heat there would be no ammonia left.

A Member suggested that heating would act the same as stronger chemicals.

The meeting was then adjourned.

Talk in the Studio.

THE POWDER CARBON PROCESS.—Mr. Werge has added to his little pamphlet on producing pictorial backgrounds, instructions for producing opal pictures by the powder carbon process, which will be welcome to many. We shall refer to this little tractate again.

LECTURE ON PHOTOGRAPHY.—A lecture on the History and Practice of Photography was delivered in Guernsey on Tuesday week before the Working Man's Association, by Mr. T. Singleton. A crowded audience listened with much interest, and the lecture was regarded as a decided success.

HOW MANY SITTINGS SHALL THE PHOTOGRAPHER GIVE FOR NOTHING?—The case recently tried in Brooklyn (U.S.), as to a photographer's claim for rejected photographs has been decided in favour of the photographer. Seventeen sittings having been given, the lady and gentleman, being dissatisfied with all, declined either to sit again or pay for the trouble given. The photographer, Mr. F. E. Pearsall, sued them for \$24, a sum a little less than £5 sterling, for the trouble involved. The judge, having taken time for his decision, has now decided in favour of the photographer to the full amount. We shall shortly have some further remarks on this subject.

POISONING BY STRYCHNINE.—Photographers have no need to use strychnine, and it does not come within the list of photographic poisons; but the knowledge of the proper remedy may

at any moment be useful. A correspondent of the *Scientific American* says:—"I once happened to receive a dose of strychnine, in the year 1853; but as I knew the remedy, I was cured, being promptly attended to by Mr. Gregson Harrison, who applied the means discovered by Dr. Grace Calvert, in 1852. The remedy is: To counteract strychnine, and cause it to be brought away by vomiting (if it has not been taken more than thirty minutes), pour down the throat half a grain of nitrate of soda every twenty minutes until vomiting takes place. The patient will then sleep about forty hours, and awake all right. The sensations caused by strychnine are, first, slight pains in the back of the head, then extreme cold in the toes, travelling up to knees; then cold in the fingers, travelling to the bottom of the breast bone.

To BLEACH GLUE.—Soak in moderately strong acetic acid for two days, drain, place on a sieve, and wash well with cold water. Dry on a warm plate.

To Correspondents.

THE YEAR-BOOK OF PHOTOGRAPHY FOR 1876.—In a few days will be published the YEAR-BOOK OF PHOTOGRAPHY for 1876, which will far exceed, in size and comprehensiveness, any of its predecessors, and will contain, in fact, a greater mass of original communications than any photographic annual previously published. Besides the usual information and the compendium of the improvements of the year, it will contain articles from the pens of Francis Bedford, H. P. Robinson, Adam Salomon, Valentine Blanchard, R. W. Thomas, Captain Abney, Wm. Mayland, J. H. Dallmeyer, Jabez Hughes, J. Werge, Col. Wortley, Alfred Hughes, Dr. Anthony, Dr. Diamond, Dr. Vogel, Dr. Phipson, Dr. Maidstone Smith, Dr. Nicol, Frank Howard, Robert Faulkner, J. W. Swan, N. K. Cherrill, H. Baden Pritchard, Herr Kleffel, Constant Delessert, J. R. Johnson, Baynham Jones, John Spiller, R. Kennett, J. H. Watson, E. Dumore, G. Cecil Hance, Captain Waterhouse, Wm. Bovey, Wm. Neilson, G. Oughton, S. Bottone, J. H. Burton, W. Heighway, D. K. Griffith, J. Martin, J. W. Young, E. Cocking, T. Gulliver, E. Viles, T. Tedrake, G. Penny, E. Batho, R. Greaves, R. Laurent, Wm. Brooks, F. Hudson, C. Waldeck, Dr. Van Monckhoven, J. A. Spencer, J. R. Sawyer, D. Winstanley, R. Slingsby, Marshall Wane, J. Brier, A. Borsland, T. Brownrigg, O. Durand, C. Ferranti, Sydney Smyth, S. T. Griffiths, Canon Beechey, W. T. Wilkinson, J. Pepper, W. M. Ayres, G. Willis, Carey Lea, R. H. Preston, W. Gillard, B. Wyles, J. S. Tulley, J. Barker, L. Warnerke, J. W. Gough, R. W. Aldridge, G. Walter, O. W. Love, J. Eldridge, F. Sutcliffe, A. Johnston, Captain Turtton, Thomas Sims, A. C. Burgess, J. C. Stenning, A. Ford Smith, Tudor Williams, T. Hicks, C. J. Eve, C. R. R. Vernon, G. Hooper, A. J. Bool, G. Bruce, A. Clarke, P. Le Neve Foster, C. Pearce, A. Pumphrey, O. Knight, R. Mitchell, M. Piquete, H. Vanderweyde, W. Woodbury, S. G. Eliot, W. Ball, T. Hackett, and many other gentlemen of ability and experience. The YEAR-BOOK for 1876 will be more fully illustrated by designs and diagrams than any other previously issued.

W. W. O. K.—You have scarcely, it is probable, given much attention to the subject of enlarging and the sensitiveness of papers for the purpose. With the completest system of moving to follow the motion of the sun you would not get an enlarged print from a negative or ordinary sensitive paper in a day. The solar camera, when fitted with a very powerful condenser, with clock-work arrangement to follow the sun and keep the image from moving, will, with good sunlight, produce an image on sensitive albumenized paper, and yield an image in about one hour. Iodized paper will yield an image with such a camera, with a few minutes' exposure, which will be pretty good after development; but without such condenser and bright sunlight it is hopeless to think of securing an enlarged image. A long exposure is required for such an image on a sensitive collodion film if no condenser be used. The safest, simplest, and most efficient method of enlarging now known consists in producing an enlarged negative on collodion from a transparency.

J. E. GILL.—No treatment is absolutely necessary preparatory to using the burnisher, but it is recommended to use a solution of Castile soap in absolute alcohol, to slightly rub over the face of the print. This facilitates the process of burnishing without leaving any perceptible trace on the face of the prints.

J. P. is a little difficult to please. We could not tell that he did not wish the signature to his letter to be used; nor could we tell that he was making a suggestion without ascertaining what we had published. We shall have pleasure in repeating or referring him to some of the formulae by which we have seen good results produced. Of course we cannot always guarantee the workable quality of formulae sent to us by contributors and correspondents.

BOB.—By careful study and long practice you may acquire the art of colouring photographs in oil from the work in question, which is the best written guide you can possess. But you must bear in mind that much practice, as well as natural aptitude, will be required. Such an art is not acquired in a day. Linseed oil, the purest and clearest you can get, is used to mix with and dilute all the colours. But besides this, turpentine is sometimes used, and sometimes, indeed most commonly, a medium made by mixing linseed oil, turpentine, and driers. But oil and poppy oil have their uses; but until you have acquired experience, confine yourself to linseed, driers, and turpentine, or at times, for glazing purposes, a little maggilp, or say Robertson's medium. Turpentine may be added to mastic varnish which is too thick.

B. L. E.—A good condenser for a solar camera may be of about nine inches diameter, and eighteen inches focus. Price will depend on manufacture; but that is a point into which we cannot enter. A dealer will inform you. A French one may be obtained at a moderate price.

A PROFESSIONAL PHOTOGRAPHER takes exception to the remarks in our last, under the heading "In and Out of the Studio," on the subject of "Successful Photographers." He submits that in some of the instances of success mentioned, the success has been in the trade associated with photography, rather than in photography itself. He contends that those engaged in the commerce of photography are no more photographers than picture dealers, such as Mr. Agnew, are artists. The distinction raised is, we fear, not one of any vital interest to our readers; but if it were more so, it would be very difficult in photography to maintain it. Probably every photographer who has a business of his own is trader as well as photographer. Certain it is that in photography, probably in every other art or industry, no fortunes are made without the judicious use of the trade element. Successful photographers generally employ a number of persons—operators, printers, clerks, frame-makers, colourists, &c.—and aim to make a trade profit out of every one they employ. The mere remuneration for labour of the most skilled photographic work would not realize a fortune. It is the happy union of many qualities of a business character, with the executive photographic ability, which secures success. Sometimes the skilled photographic element will be the most powerful agent in leading to success, sometimes the business enterprise; but it is difficult, if not impossible, to draw the line, and say who is trader and who is photographer, especially as in almost every case we know the trader began as photographer.

FRANK M. SUTOLIFE writes: "Your correspondent 'Hansel Monday' advises you to beware of me, for I am a 'sinner'; but does not state the nature of my sin; will she please do so, that I may, if necessary, repent? I presume Miss Monday thought it very sinful of me to tell others how to prevent an accident which befel myself, viz., the breaking of the syphon of my porcelain washing trough. Perhaps your correspondent is a manufacturer of such articles; hence her anger. As Miss H. Monday is, no doubt, very clever, might I trouble her to tell me what *did* break my syphon, if it was not the expansion of the water inside the same as it turned into ice? (probably, Miss Monday has an old maidish notion that it is the *thaw* which bursts our water pipes) for broken my syphon is; and when I discovered the breakage, the syphon was filled with ice; and when the ice thawed, one-half of it tumbled into the sink. After all, perhaps, Miss Monday had not a reason for calling me a sinner, and only did so for the same 'reason' that she calls her cat 'naughty pussy' when Miss M. drops a stitch of her knitting, though poor puss is fast asleep on the hearth."

M. F.—Yes, you may get very good results in large portraiture, with a single lens, in a very good light. If you stop down the lens, so as to secure fine definition, you will, of course, make it slow. For open air experiment on a fine day your single lens will answer.

W. G. (Bristol)—Cyanide of potassium will remove the stain; but it will be best first to apply a 5-grain solution of iodide of potassium. The material being grey will probably show no subsequent stain; but without knowing what the original dye was, it is impossible to say certainly.

W. G.—A tarnished glass positive is difficult to deal with, but a weak solution of cyanide is safest. Be careful not to use the cyanide too strong.

Baynham Jones, Captain Waterhouse, P. Le Neve Foster, E. Greaves, W. Ball, R. Slingsby, Marshall Wane, R. W. Aldridge.—Received, with thanks.

F. HUDSON.—Thanks; duly received before.
Several correspondents in our next.

The Photographic News.

Vol. XIX. No. 904.—DECEMBER 31, 1875.

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PHOTOGRAPHIC CHRISTMAS CARDS.

THE remarks in our pages a few weeks ago on the possible use of photography for producing the cards so current at this season of the year as messengers of yule-tide greeting and new-year good wishes, have elicited communications from several correspondents, who send us examples of what has been already done in this direction. In each instance where the attempt has been made, commercially, to introduce photographic Christmas cards it seems to have been a failure. Mr. Werge, who appears to have entered into the project with spirit and enterprise, and was so far successful that last year he sold three thousand copies, still finds the project a pecuniary loss, and entertains no hope that it contains an undeveloped success. Both the photographs and the mounts were much admired, we are told, and the circulation, as we have seen, was not very bad; but they did not pay. The statistics with which Mr. Werge favours us are interesting and instructive, and we will therefore make a few extracts from his letter. Speaking on the subject of price, he found that he had fixed it too low, and yet it is doubtful whether a higher price might not have been still more prohibitory. He says:—

"To give them a chance of going, I determined to offer them that they might be retailed at sixpence, and I had to supply them to the wholesalers at thirty-six shillings per gross, and to the stationers and others at four shillings per dozen, giving at the same time, in accordance with trade usage, thirteen as twelve. Considering the trouble of getting up the negatives (I had thirteen varieties) the cost of the ornamental cards, ninepence per dozen; the cost of printing, mounting, and rolling; and the time and cost of introducing them, they decidedly did not pay, so I determined to have nothing more to do with photographic Christmas cards, though I disposed of nearly 3,000 last year."

The shop-windows devoted to such things last year, Mr. Werge remarks, contained plenty of examples of his cards, and he adds that, this year, there are two kinds of photographic cards in the shop-windows, one of which consists of copies of pictures bearing on the birth and life of Christ, with suitable quotations from the Holy Scriptures. The other is a poor attempt to make a child do duty for the infant Christ. "I consider it impossible," Mr. Werge continues, "for photographs ever to become popular as Christmas cards; and the best coloured photograph cannot compare or compete with the charming little pictures now published either in design, colour, price, or fitness."

This experience is confirmed by one or two other correspondents who, on a less extensive scale, have made the attempt to introduce photographs in place of the familiar Christmas cards. Mr. Werge supplies two reasons for the failure—one, the necessary expense of the production; and another, the inferiority in fitness for the occasion. The gay

festive character of the season seems, he thinks, to demand colour in place of sober monochrome, and there is, unquestionably, much in the argument. What the precise aesthetic bases may be which demand fulness of colour in connection with Christmas festivity it may not be easy to determine; but certain it is that an instinctive tendency is manifest everywhere, in everyone, to contrast the sombreness of the season with gaiety, richness, and fulness of colour. All the decorations of every kind, for every purpose, used at Christmas-time, are full of colour, and the designer who should propose to decorate a room for a yuletide festivity in delicate greys and whites, no matter how exquisitely perfect the taste of the decoration, would be laughed to scorn. One of Mr. Whistler's 'symphonies in white,' or anything analogous, would not get a moment's attention amongst a heap of Christmas cards or even bon-bon boxes. The rainbow, confined to the sky in summertime, is at Christmas cut up to ornament Christmas presents and give brilliancy to Christmas entertainments; and it must be admitted that a card photograph, compared with the glowing colours and really artistic designs of the Christmas cards issued by Marcus Ward and others, are comparatively poor and gloomy.

But if photographers have at any time to enter successfully into this kind of competition, we think some modification of the subjects may probably be necessary. Amongst the examples sent us by various correspondents there are many pretty little genre pictures, but none with any essential fitness for the occasion. It is not our purpose here to indicate special designs which would be likely to catch the public taste; but we would suggest that the idea of greeting should in some way enter into the subject. One photographic design we have seen of a very simple kind, not without some fitness. It is simply a pair of hands cut off at the wrists, a gentleman's and a lady's, grasping each other in loving clasp. They are beautifully modelled hands, and admirably photographed, mounted in an oval, with coloured wreath around, and words of greeting. The latter condition, the coloured, ornamental mount, is an important one, and Mr. Werge's cards were admirably provided in this respect; but some of the examples sent to us are mounted in the ordinary way, with greeting words printed plainly in black on the bottom margin of the card.

One of the prettiest adaptations of photography to the purpose in question, has reached us from a friend outside photography, who has applied it to his own purpose. It consists of a card, with very elegant designs in gold and colours, with verses, motto, and greeting. In the centre is one of the pretty movable wreaths, which lift up to disclose fresh designs. The centre of this wreath, forming an oval aperture, contains a photographic group of four pretty children smiling their greetings. They form the juvenile household of the friend who sent the card, and surely no Christmas present could be more welcome, none more fitting than the faces of those we love thus interwoven with the warm and tender greetings of which Christmas time is the happily chosen occasion! To facilitate the exchange of such cards, it would be wise for the portraitist to provide himself with suitable cards, and a good example or two on his table at the proper season would doubtless lead to a wide adoption of photographic portraits, as a pleasant adjunct to the gorgeously-coloured card, for exchange on Christmas and New Year festivals. Some others, with a similar fitness of a somewhat simpler kind, have reached us. Here is an example: a bonny boy, whom we at once recognize as the son of a friend, although we have never seen the lad, is on the ice with his skates, in the midst of an effective snowy wintry landscape. He is well wrapped up, with catohel and slate, apparently going to school. On his slate we read the greeting he brings us, "A merry Christmas to all!" Whilst we are reading the greeting he, with a pleasant roguish smile, threatens us with the snowball held up in his hand. This, with its coloured margin, is also a pleasant form of photographic Christmas card. The adoption of

such cards, which, really, are more suitable for photography would, in a commercial sense, be really beneficial to photographers, as giving a fresh impetus to portraiture generally at a period of the year when the portraitist is rarely overburdened with commissions.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE FIRST EDITION OF SHAKESPEARE—PHOTOGRAPHY IN THE LAW COURTS—THE BREMERHAVEN EXPLOSION.

The First Edition of Shakespeare.—One of the best examples of the value of photography in connection with rare works is the reproduction, under the auspices of Mr. Halliwell Philipps, of the original edition of Shakespeare. A copy of the original work, of which only two or three examples are known to be in existence, is valued at about 700*l.* or 800*l.*, and it is even unlikely that an intending purchaser, willing to give this amount, could procure the object of his ambition. A photographic reproduction of the work, as Mr. Philipps correctly points out, is for most purposes of research, quite equal to the original, and therefore all Shakespearean students will be in a position to acquire, at a comparatively small cost, the possession of a work which the majority of them would otherwise have had no chance of getting a peep at even. A comparison of the text in the first edition with those of to-day is at once rendered possible to scholars and playgoers innumerable, and these owe much to photography for placing within their reach such a rare and interesting production. The Doomsday Book, as our readers are aware, was one of the first works multiplied in this way by photography, but in this case the number of those interested was necessarily limited, while Mr. Philipps is likely to have a very extensive circle of readers. We trust that he may be tempted to issue more than one edition, but this he will not do in any case until it is seen how the sale of the first reproduction progresses. There will necessarily be much work connected with the appearance of this first edition, because, as every photographer is aware, when the ground upon which the type is impressed in the original is not perfectly white, and there are spots or stains, these have to be carefully expunged from the plates before the printing off can be commenced. But once a good copy has been produced, the type of which is black and sharp, there will be no difficulty whatever in photographing the same once more any size that may seem desirable, and for this reason we hope that before long a handy volume copied from the original will be purchasable at a small sum, and this would, we feel sure, find a ready sale with the general public.

Photography in the Law Courts.—Every day we hear more of photography being introduced into the Law Courts, for the camera can produce a facsimile which is admitted as evidence when other copies fail to be so regarded. A photograph of a document bears upon it the impress of truth—so much so, indeed, that in most cases it would have as much influence with a judge or jury as the original itself. Unfortunately, we regret to see that the facility with which photographic reproductions are obtained has given rise to a practice of secretly purloining for a time valuable documents for the purpose of getting them copied in this way. When it is known that one side possesses documents of importance in a case which are unlikely to be produced in court, efforts are not unfrequently made by the other side to get photographic copies taken of them. Mr. Sothorn, the comedian, only the other day, complained that certain letters had been taken out of his possession for a short time with this intention; and in the *cause celebre* of *Sampson v. the Times* some documents of considerable interest were proved to exist, it may be remembered, by the production of photographic copies which one side had sought to ignore altogether. In any case where the originals are not produced a photographic copy of the same is very powerful evidence, and will often serve to convince a jury. One of

these days, perhaps, we shall have the camera in the hands of the officers of the court, and we shall have such things as certificated copies and certificated photographs of all sorts of places and objects put in as evidence. For while in most instances, when it is simply a matter of reproducing black and white, or certain outlines, the most perfect reliance may be placed upon photographs, there are instances, as every landscape photographer knows, when a good deal may be done to favour one side or another. If you wanted to prove, for instance, that a certain locality was so bare and lonely that the erection of a factory would be no disfigurement to the neighbourhood, you need merely choose a lens which will depict very sharply the barest spot in the place chosen on purpose for your picture, and which will diminish the effect of any foliage or undulations of country existing some little distance off. The result produced would be very different from one obtained by an artistic photographer from the most picturesque point of view and with a lens adapted to give the most beautiful effects of the country in the neighbourhood. For this reason it is that we say that if photography is ever to be used extensively in our law courts it would be well if official photographers were attached, for the purpose of collecting and affording evidence on any points where their assistance would be of value.

The Bremerhaven Explosion.—The terrible explosion of dynamite or nitro-glycerine, at Bremerhaven, has called public attention once more to the transport and storage of such dangerous materials. In the instance we speak of it is uncertain whether the explosion occurred from the clock-work apparatus inside the package acting prematurely, or from the material having become frozen or crystalline, in which condition a very slight concussion, such as the unloading of the case from the van, would suffice to set it off if it were nitro-glycerine. The new Explosive Act of 1875 classifies photographers' gun-cotton in the same category as nitro-glycerine and all other nitro-compounds, and if stricter regulations should result from this accident they will fall equally upon the photographic community as upon the engineer or miner who employs dynamite or nitro-glycerine for blasting purposes. Nitro-glycerine, in cold weather, is, however, much more dangerous than gun-cotton, for the latter is naturally not affected by frost, while the liquid explosive will, according to some chemists, solidify at 40° Fahrenheit, eight degrees, therefore, above the freezing point of water. The lamented death of Mr. Mawson, of Newcastle, whose colloidion is known all the world over, was due, as our readers may remember, to the accidental explosion of a package of this terrible agent, which had become frozen, and had been removed outside the town of Newcastle for destruction in a lonely neighbourhood. On this occasion the explosion was due simply to scraping the material with a shovel, and therefore, if the package of nitro-glycerine at Bremerhaven was in the same state (and the rigorous weather at the time would lead to this conclusion), it seems more than probable that the concussion on unloading the package on the quay was sufficient to determine the explosion. The German Government has issued stringent instructions for the removal of all stores of nitro-glycerine and dynamite to places of safety; but we suppose that there are not sufficient quantities of gun-cotton to necessitate legislation on account of this compound also, or, what is more likely still, pyroxiline is considered by German authorities to be a much safer product.

CHEMICAL NOTES FOR YOUNG PHOTOGRAPHERS.*

GALLIC ACID (*Acidum Gallicum*).—Formula, $C_7H_5O_4$, + 2H₂O.

Preparation.—Mix finely-powdered outgall with sufficient distilled water to form a thin paste, and expose the mixture to the air in a shallow glass or porcelain vessel, in a warm

place, for a month, occasionally stirring it with a glass rod, and adding from time to time sufficient distilled water to preserve the semi-fluid consistence. Then submit the paste to expression, and, rejecting the expressed liquor, boil the residue in distilled water a few minutes, and filter while hot through purified animal charcoal. Set the liquid aside for the crystals to form, and dry them on bibulous paper.

Properties.—Gallic acid is in delicate, silky, acicular crystals, which, as ordinarily found, are slightly brownish, but when quite pure are colourless. It is isodorous, and of a sour, astringent taste. It is soluble in 100 parts of cold and three of boiling water. It is very soluble in alcohol, but slightly so in ether. It has been found to be soluble in glycerine, in the proportion of forty grains to the ounce, and that the solution may be diluted to any extent with water without affecting its transparency.

Photographic Uses.—Gallic acid is extensively used in photography in various processes, as the Tannin Process of Russell, Dry Process of Taupenot, &c., and in Positive Printing by Development.

PYROGALLIC ACID.—Formula, $C_12 H_6 O_6 = 126$.

Preparation.—Gallic acid is introduced into a bronze boiler with twice or three times its weight of water; the temperature is raised to a point from 392° to 410° F., and maintained at that point for half an hour, when the liquid is allowed to cool. The solution in the boiler is now heated with a little pure animal charcoal, filtered, evaporated sufficiently, and set aside to crystallise.

Properties.—Pyrogallie acid is in white, shining scales, inodorous, very bitter, soluble in three and a half pints of water, readily soluble by alcohol and ether. Though unalterable in the air when quite dry, it is rapidly changed in a watery solution by the absorption of oxygen. The alcoholic solution is unchangeable.

Photographic Uses.—Pyrogallie acid is used extensively for the development of the latent image and for intensifying.

FORMIC ACID.—Formula, $C_2 H_4 O_2$, HO=46, sp. gr. 1.235. —Its name is derived from *formica*, an ant, an insect which stings with this acid.

Preparation.—Formic acid can be obtained by distilling ants in water. It is an organic acid, however, which can be formed artificially by heating organic substances, such as sugar, starch, &c., with oxidizing agents. It may be prepared as follows:—Equal weights of oxalic acid and glycerine, with one-eighth of water, are heated in a retort to 220° F. Effervescence ensues, and continues for some time, during which formic acid distils over. To obtain the remainder, add one-third of water and distil again; repeat the addition of water until about four parts have distilled over.

Properties.—Hydrated formic acid is a limpid, colourless fluid, of an extremely pungent odour; it fumes slightly.

Photographic Uses.—It is an excellent reducing agent, and when heated is used by many photographers in their developing solutions.

CHROMIC ACID (*Acidum Chromium*).—Formula, CrO_3 .

Chromic acid is readily obtained by mixing 100 measures of a cold, saturated solution of bichromate of potassa with 150 measures of sulphuric acid, and allowing the mixture to cool. The sulphuric acid unites with the potassa, and sets free the chromic acid, which is deposited in crystals. The mother-liquor being poured off, these are placed on a tile to drain, covered with a glass bell-jar.

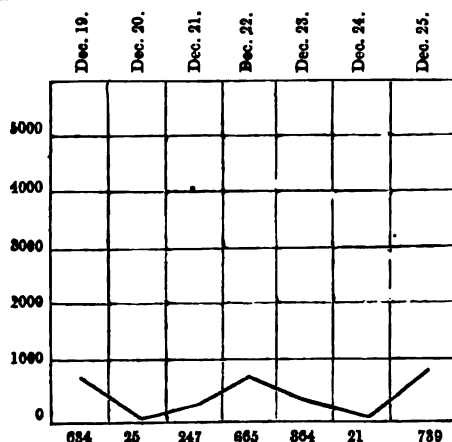
Properties.—Chromic acid is in the form of anhydrous, acicular crystals of a brilliant crimson-red colour, and an acid metallic taste, deliquescent, and very soluble in water.

METEOROLOGICAL REPORT SHOWING THE DAILY VARIATIONS IN THE QUANTITY OF LIGHT EMITTED BY THE SOUTHERN SKY FROM OBSERVATIONS MADE AT BLACKPOOL.

BY D. WINSTANLEY, F.R.A.S.

DURING the past week the daily average of light has risen, being 385 units as compared with 159 units during the

week preceding. Two days, Monday and Friday, have been extremely dark, the records showing 25 and 21 units respectively. Christmas Day was the brightest day of the week.



FOREIGN MISCELLANEA.

THE Photographic Society of Toulouse, which has only been in existence a few months, shows plenty of activity. It has its own organ, the *Bulletin de la Societe Photographique de Toulouse*, which we have already quoted in these columns, and now we hear that two series of medals are to be offered by the Society for the best apparatus and lens for dry plate work. One class of medals is to be awarded for the best cameras and stands, and the Society recommend, although they do not specify it as a fixed condition, that the apparatus should be adapted for half-plate negatives; it must be exceedingly simple, light, and portable, and at the same time firm and solid. It should also be capable of being rapidly put in position. Constructors and designers of apparatus are to send in their work to Toulouse by the 30th of March next, addressed (carriage paid) to M. C. Fabre, secretary of the Society, 8, Rue des Renforts, Toulouse. The second series of medals will be offered for lenses suitable for the above apparatus.

Paris photographers are making arrangements to send exhibits to the Philadelphia International Exhibition; among others, M. Liebert will be a large exhibitor.

M. Leon Vidal has received an honorary medal from the Belgium Photographic Society in testimony of the appreciation of his services in bringing the helio-chromic process to a practical issue. The office of the *Moniteur Universel* in Paris is exploiting M. Vidal's printing process, and has fitted up, it is said, extensive machinery for working the same. We may, therefore, soon expect to see some commercial examples of the much-talked of process.

Brussels has followed the example of London and Paris, and has just started a Benevolent Society, under the title of *Societe de Secours Mutuelle Photographique Belge*. Its aim is the same, pretty well, as the Society in this country, namely, to give help to its members in case of sickness or accident, and to procure employment for those out of work. M. Delabarre is President, Dr. Van Monckhoven Vice-President, and M. Géruguet, of the well known Brussels firm, is Treasurer.

In the *Bulletin Belge de la Photographique* is a formula for preparing plain salted paper. A warm solution of the following is made up:—

Chloride of sodium	...	...	35 grammes
Nelson's gelatine	...	...	35 "
Orange juice	...	...	35 "
Water	...	...	1½ litres.

Paper immersed in this solution, and afterwards dried, is sensitized on a silver bath in the ordinary way; it is very sensitive.

A method is also given of preparing dry plates without the use of collodion. A mixture is made of:—

Albumen	...	...	...	125 grammes
Honey	...	...	...	110 "
Iodide of potassium	...	...	4	"
Bromide of potassium	...	...	1	gramme
Dry chloride of sodium	...	...	3	decigrammes

The mixture is beaten to a snow, and then allowed to stand for twenty to twenty-four hours. A plate coated with the composition, dried on a stove, and then allowed to cool, is sensitised in the ordinary fashion.

As we premised, one of the officers who accompanied M. Tissandier in his last unfortunate balloon voyage, when every passenger was more or less injured, turns out to be the Commandant, or rather Colonel, Laussedat, well known in photographic circles. We are glad to hear that his wound is not dangerous.

NOTES ON EMULSIONS.

AN AMATEUR, writing to the *Photographic Times* on working emulsions, gives some interesting experience. He says:—

As an "amateur" I am not confined to any one way of working, as nothing is dependent on the result, except the satisfaction of having the result perfect, no matter what the means taken to get it. For that reason I some time ago began with dry plates. I began with the good old Coffee Process, which I yet think is one of the best for dry plates. After trying many kinds, I at last resolved to try an emulsion. I did try, and I tried many, but failed to get what I wanted. About a year ago I met Mr. H. J. Newton in New York. He was kind enough to not only give me his formula, but to show me how to make an emulsion; since that time I have had no trouble. I have given up my bath—it now stands in my dark-room in its bottle, where it will continue to be so long as I can make emulsion do its work.

I use two different formulae of Mr. Newton's, the one I had of him first, and his latest, which was published in last month's *Times*. That being published, I will give the first one, which I have used with very great success.

PLAIN COLLODION.

Cotton, seven grains to the ounce; alcohol and ether, equal parts.

Take one ounce of collodion, and add ten grains of bromide of cadmium; mix it well, then add fifteen grains of silver, dissolved in three drachms of alcohol.

Shake well, then add two grains of chloride of cobalt, or chloride of calcium, dissolved in a little alcohol. Shake at times, and in twelve hours it is ready for use.

Coat the plate, and as soon as set wash it in a dish of pure water, then put it in a dish containing the preserver.

The preserver may be made with laudanum and tannin, or laudanum and nux vomica; I do not find much difference in them. After it has been in the preserver a short time, take it out, and drain it on a piece of blotting-paper; then put away to dry, resting the plate on a corner. There should be as little light in the room as possible. When the plate is perfectly dry it is bright and glossy on the surface, and thick enough to need no backing. I expose about three times as long as for a wet plate, in some cases four or five times as long. There is no danger of over-exposure, only be sure and give time enough. A great advantage in dry-plate work is the fact that you can regulate the exposure. To develop, I make two solutions, viz.:—

No. 1.				
Pyro	...	...	4	grains
Water	...	...	1	ounce.
No. 2.				
Water	...	...	3	ounce
Ammonia	...	...	4	"
Bromide of ammonium	...	...	5	to 10 grains.

Wash the plate well under the tap. Then flow with pyro solution; keep it on a short time, and if your plate is all

right the detail will show; bring it well out with the pyro. Then add two drops of the ammonia solution. It will rapidly come up to the required strength. If not strong enough you can wash, and use the acid pyro solution that is used for wet-plate work; but by adding ammonia you will almost always get all the strength you want. Fix in hypo or in cyanide. There is one thing that workers in emulsions should bear in mind, that the development must not be forced to get good results. But I do know from a year's work, that an emulsion, carefully made by this or by the other formulae of Mr. Newton's, will work with more regularity, and is more to be depended on than wet plates. I see that some who have tried it complain of fogging. With this formula I never had a fog or a sign of one. I am aware that this same process has been given to the public before, but it may do some good to present it again.

DESPAQUIS ON PRINTING PROCESSES WITH FATTY INK.*

It is a very simple communication which I propose to make on the present occasion. My process is, as most of you know, the bichromated gelatine method of M. Poitevin, the improvements I have made bearing upon the two following points:—

The film of bichromated gelatine, whether upon a glass plate, as in the Albert process, or upon a film of leather-collodion or paper—in one word, whether upon a translucent support, or even upon no support at all—is exposed in the ordinary manner under a cliché. This done, I again expose the film to light from the back in such a way that this second action of light works up to the half tones of the image in front. After this, there remains under the image no longer a film permeable to water; the two exposures having joined in their action, close like two links of a chain. You may judge when the second insolation has gone sufficiently far, by a fogging being produced over the image, which seems about to disappear altogether.

The film of gelatine is thus rendered insoluble throughout its thickness, and has become impermeable to water, except in a slight degree on its upper surface, where it is in a condition to absorb water sufficient to repel the ink, where the image is to remain white, or in half tone. No moisture can insinuate itself between the support and the image, to soften the gelatine not acted upon by light, and take away from the solidity of the printing block. Consequently the fineness and purity of the picture are preserved.

The other point is, that I do not moisten the block with a wet sponge and dry with a rag or tuft of wool; I moisten the surface with the aid of a hard, but porous stone roller, which may be covered with a supple stuff impregnated with water. The wetting of the plate is then conducted uniformly. If the gelatine swells a little, the water does not accumulate in the hollows which are to take the ink, an advantage which secures to the prints all their purity, whatever may be the number pulled off. My plan of moistening the block has also the advantage of rapidity.

My two improvements, consisting of imparting solidity to the film, and moistening the film in the most advantageous manner, permit me to do my printing by steam machinery, and in this way the production of pictures is made cheaper than has ever yet been known.

I also ask the Society for permission to communicate the details of a modification, which I have carried out in the preparation of my bitumen paper, called *mica factice*. This modification, I should say, was suggested to me by the communication made at the last meeting by M. Rodrigues, of Lisbon, and on seeing the productions which he exhibited to the Society. My modified paper allows me to obtain all the results secured by M. Rodrigues.

I prepared the paper as I did five years ago; that is, I interpose between the gelatine and the bitumen a film of gum.

* Read before the French Photographic Society.

Only, in accordance with M. Rodrigues' ideas, I add to the bitumen a fine powder, insoluble in the essences and in benzole, but soluble both in water and in the acids, destined to etch the metal or glass. I say glass advisedly, for I believe that with the aid of my intensifying process with caoutchouc, it is possible to obtain upon this substance blocks quite sheltered from oxidation, which will keep as well as wood blocks.

As soon as the print is obtained and washed in the essence, while the film is still soft, it is applied, with the bituminous side to a plate of metal or hard glass, slightly warmed. Above is placed a sheet of strong but unsized paper, moistened in water, and the whole is put under pressure of a supple roller, made of gelatine and caoutchouc. The moisture of the paper penetrates the gelatine, reaches the gum, and at the end of a few minutes the whole may be lifted off, leaving the bitumen adhering to the plate. It is, nevertheless, better to dry the film in the first place, and then detach the paper and gelatine by a subsequent moistening operation.

In this way we imitate the conditions of M. Rodrigues; the grain is produced by the disappearance of the dissolved powder either by water or acid, and we have then a block capable of producing fine mechanical prints.

Correspondence.

DISSOLVING VIEW APPARATUS.

SIR,—In answer to some correspondents, I add to my former communications on the lantern, a few remarks on the dissolving view apparatus.

The double-lantern or dissolving view apparatus is not only required for showing a series of pictures artistically and without an hiatus, but is absolutely necessary for the production of dioramic effects, these even sometimes requiring three lanterns. The simplest effect slide is that called the slip slide, which consists of a piece of glass set in a frame, over which one, and sometimes two, other pieces of glass are so arranged that the exhibitor with his hand can cause them to slide backwards or forwards over the first one. Parts of the picture being painted on each piece of glass in this way, phantasmagorical figures are produced, seemingly in motion. These slides can be shown by means of one lantern only. The next most simple effect slide is the lever slide; this consists of a circular glass set in a frame, on which is generally painted the principal part of the picture, over which another circular glass is set in a brass rim, having a handle, and is so arranged as to allow the handle or lever to be worked up and down to a certain extent. Various parts of the picture, as before, are painted on both glasses, and the painted side of all the effect slides are placed towards each other, but not allowed to touch. This description of slide can also be shown with single lantern.

Next follows the rackwork slide. These have either a single or double action, and are worked by a pinion, which is attached to a small crank rotated by hand. The single rackwork is applicable to such pictures as represent mills with moving sails, or water, &c. The double rackwork is used for chromotropes and various other effects; these also can be shown with one lantern.

I will now give an instance in which two lanterns are required. The first picture represents Napoleon reviewing his troops on the Champ de Mars, Paris. This changes to the Emperor lonely and captive, standing on the shore of St. Helena. The transformation is effected by some parts of one picture being left out in the other; but the figures of Napoleon must be exactly alike in colour, drawing, size, and position in each of the two pictures. The lanterns must be accurately arranged so that they may exactly overlap each other when shown on the screen. I need hardly say that before the exhibition commences the two lanterns must be brought into such a position relative to each other,

and firmly fixed, that the two circles of light on the screen shall seem as if they were but one only, and a picture, when shown by either lantern, shall appear to be equally sharp in focus and of equal size. That this may be the case, it is necessary that all pictures intended to be shown at one time should be of the same diameter, and their frames of uniform dimensions, and, for the sake of portability and weight, these latter are never made to the full size the lanterns would admit; it is thus imperatively necessary that a carrier should be provided for each lantern having a circular opening properly centred, and of somewhat smaller diameter than the pictures themselves. A prolongation of one end will form a handle, and on its upper side should be inserted a pin or stop to prevent its being by any inadvertency thrust further across the lantern than the point at which it should rest.

Most objects apparently in motion should not be allowed to cease their action in sight of the spectators, otherwise the effect is entirely spoiled. This is particularly the case with chromotropes. It being at times quite impossible for an exhibitor to do all that is necessary single-handed, it becomes his best plan to procure, if possible, a volunteer assistant; and a rehearsal, for the purpose of his initiation, should be gone through if necessary, his duties being allotted to him. His particular attention should be directed to their performance methodically, without noise or undue haste.

I intend to offer some further information on the subject of dioramic effects by means of the magic lantern shortly.—
I am, dear sir, yours truly,
JAMES MARTIN.
5, Clarence Place, Ilfracombe.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

DEAR SIR,—Will you kindly allow me to announce that the second annual general meeting and entertainment of this Association will take place at the Co-operative Hall, 55, Castle Street, Oxford Street, W., on Monday, January 24th. The concert will be under the management of E. Cocking, Esq., and the lantern exhibition of F. York, Esq. All shortcomings in last year's gathering were duly noted, and will be avoided this time.

Further particulars will be advertised next week.

The admission will be by ticket only, one shilling, and may be had on application to yours respectfully,

W. T. WILKINSON.

174, Fleet Street, E.C., Dec. 24th.

Talk in the Studio.

SPIRIT PHOTOGRAPHY.—At a recent meeting of the Berlin Photographic Society a communication from Dr. Stein was read in which he stated that he had recently met, at a spiritualistic congress, the notorious Parisian spirit photographers, Ruguet and Leymarie, and although he exposed them then and there, by taking similar photographs, he failed to convince the audience. The explanation is simple. Dr. Stein had a negative in his pocket, which he copied by the light of a candle, in the dark room, before developing the portrait of the gentleman who appeared with a female "spirit" at his side.—*English Mechanic.*

BLACK SPOTS ON PRINTS.—Mr. J. B. Butterfield, writing to our Philadelphia contemporary, says:—"Last winter I began to be troubled with minute black specks being deposited all over the albumenized surface of my paper while washing my prints before toning, and could not discover at the time the cause. I inquired from a number of photographers in regard to my trouble, and all seemed to agree that it was the paper; so I procured a sample of two or three different makes of paper, and still the same trouble. The paper appeared to be clear when printing, but after washing was full of those black specks, which, on rolling after being mounted, would have a metallic appearance. I began to get very much discouraged, having been troubled for about two months, and experimenting all the time to find the cause of the trouble (having made different silvering solutions, but still the same result), when at last I

thought I would silver a piece of paper and not print it, but, after drying, place it in a porcelain dish, and, leaving plenty of light in my room, drew some water directly on it from the tap, and, by examining closely, I could see small particles depositing all over the surface, and which, on examination, proved to be iron-rust, having been loosened from the inside of a short piece of iron pipe by the frost over night, the moisture in the pipes freezing after the water was turned off. I caught and filtered some of the water, and was satisfied, from the deposit on the filter, that I had found the cause of my trouble, and have not used water for washing from that tap since, and have had as clear pictures as I ever had, and shall hereafter discard the use of iron pipes entirely."

TO PREVENT GLUE FROM CRACKING.—Glue frequently cracks because of the dryness of the air in rooms warmed by stoves. An Austrian contemporary recommends the addition of a little chloride of calcium to glue to prevent this disagreeable property of cracking. Chloride of calcium is such a deliquescent salt that it attracts enough moisture to prevent the glue from cracking. Glue thus prepared will adhere to glass, metal, &c., and can be used for putting on labels without danger of their dropping off.—*Scientific American*.

TO FIX PAPER ON DRAWING BOARDS.—Take a sheet of drawing-paper and damp it on the back side with a wet sponge and clean water. While the paper is expanding, take a spoonful of wheat flour, mix with a little cold water, and make it a moderately thick paste; spread the paste round the edge of the drawing-paper, one inch wide, with a feather, then turn the drawing-paper over and press the edges down on the board. After this take four straight pieces of deal wood, three-quarters of an inch by two and a quarter inches wide; place them on the edge of the drawing-paper, and put a large book or heavy weight on each corner to make the paper adhere firmly to the board. In about an hour's time the paper will be straight and even, and quite ready for executing a drawing. When the drawing is finished, take a sharp knife and raise one corner of the paper; then take a scale, run it round the edges, and the paper will come off easily. Turn it over and take the dry paste off with a knife, and all will be perfectly clean, and no paper will be wasted.—*Scientific American*.

SENSITIVENESS OF ANILINE COLOURS.—The editor of the *Rivista*, Signor Borlinetto, announces that all the aniline colours are more or less sensitive to light. Bismark brown, spread on paper in admixture with size, albumen, starch, &c., and exposed under a negative, yielded a good picture, capable of being fixed with a solution of iron containing a little alcohol. This fact would make it appear that the use of aniline colours, as a means of colouring photographs, is not to be recommended.

To Correspondents.

THE YEAR-BOOK OF PHOTOGRAPHY FOR 1876.—In a few days will be published the YEAR-BOOK OF PHOTOGRAPHY for 1876, which will far exceed, in size and comprehensiveness, any of its predecessors, and will contain, in fact, a greater mass of original communications than any photographic annual previously published. Besides the usual information and the compendium of the improvements of the year, it will contain articles from the pens of Francis Bedford, H. P. Robinson, Adam Salomon, Valentine Blanchard, R. W. Thomas, Captain Abney, Wm. Mayland, J. H. Dallmeyer, Jabez Hughes, J. Werge, Col. Wortley, Alfred Hughes, Dr. Anthony, Dr. Diamond, Dr. Vogel, Dr. Phipson, Dr. Maidstone Smith, Dr. Nicol, Frank Howard, Robert Faulkner, J. W. Swan, N. K. Cherril, H. Baden Pritchard, Herr Kleffel, Constant Delessert, J. R. Johnson, Baynham Jones, John Spiller, R. Kennett, J. H. Watson, E. Dunmore, G. Cecil Hance, Captain Waterhouse, Wm. Bovey, Wm. Neilson, G. Croughton, S. Botton, J. H. Burton, W. Heighway, D. K. Griffith, J. Martin, J. W. Young, E. Cocking, T. Gulliver, E. Viles, T. Tedrake, G. Penny, E. Batho, R. Greaves, R. Laurent, Wm. Brooks, F. Hudson, C. Waldeck, Dr. Van Monckhoven, J. A. Spencer, J. R. Sawyer, D. Winstanley, R. Slingsby, Marshall Wane, J. Brier, A. Bolland, T. Brownrigg, C. Durand, C. Ferranti, Sydney Smyth, S. T. Griffiths, Canon Beechey, W. T. Wilkinson, J. Pepper, W. M. Ayres, G. Willis, Carey Lea, R. H. Preston, W. Gillard, B. Wyles, J. S. Tulley, J. Barker, L. Warnerke, J. W. Gough, R. W. Aldridge, G. Walter, O. W. Love, J. Eldridge, F. Sutcliffe, A. Johnston, Captain Turton, Thomas Sims, A. C. Burgess,

J. C. Stenning, A. Ford Smith, Tudor Williams, T. Hicks, C. J. Eve, C. R. R. Vernon, G. Hooper, A. J. Bool, G. Bruce, A. Clarke, P. Le Neve Foster, C. Pearce, A. Pumphrey, C. Knight, R. Mitchell, M. Piquet, H. Vanderweyde, W. Woodbury, S. G. Eliot, W. Ball, T. Hackett, and many other gentlemen of ability and experience. The YEAR-BOOK for 1876 will be more fully illustrated by designs and diagrams than any other previously issued.

A. J. Mc'C.—The preservative is poured on the plate just as the plate leaves the bath, without any washing; and the ordinary iron developer is applied to the plate just as it is, without washing. The plan is a very good one when all the chemicals are in good condition; but we have known it fail when the bath was an old one, and especially if it contained much nitric acid, which acts on many samples of glycerine. We believe on the pure glycerine sold by Price and Co. nitric acid has no action.

A. S. (Dunoon).—The details of the mode of reproducing negatives by the powder process appeared in our YEAR-BOOK for 1875, the present year.

A. W. E.—The process given by Mr. Hine are simply the details of printing transparencies from a negative, the existence of the negative being pre-supposed. There are modes of producing transparencies direct from the object, but none sufficiently simple and trustworthy for general use. The production of a negative is in ordinary processes a necessary preliminary to printing the transparency.

THOMAS DAY.—The use of old negative baths for printing purposes is, with some photographers, a common practice; but we scarcely think it good economy, as unless care be used to remove all traces of iodide of silver, it frequently gives poor weak prints, which refuse to tone. If you wish to use the bath as a printing bath, instead of turning it into the residues, or restoring it as a negative bath, it will be necessary to precipitate the iodide of silver in any of the ways by which this may be done. The addition of a few drops of hydrochloric acid will throw down a precipitate of chloride of silver, carrying with it the bulk of the iodide of silver. Or the addition of a little carbonate of soda, throwing down a little silver as carbonate, will carry down a portion of the iodide of silver. Diluting the solution with an equal bulk of distilled water, pouring the bath into the water, and filtering, will remove a great deal. The plan we have often described, but which you will find described again in our forthcoming YEAR-BOOK, of converting the whole of the silver into carbonate, and then converting the carbonate into nitrate, will be the most trouble, but it will be the most effectual.

R. L.—You will be tolerably safe with any of them; but we should select No. 2. A good bellows camera will be quite sufficiently rigid to carry the portrait lens. 3. A swing-backed camera is useful in portraiture, but not absolutely necessary. For the studio the vertical movement would be sufficient.

R. N. D.—In dull foggy weather it is very difficult to get brilliant card pictures with lenses of long focus, because of the long space of foggy atmosphere between the lens and sitter; which is, of course, photographed as well as the objects. Hence it is more easy to obtain perfectly clear shadows in dull weather with lenses of short focus.

G. V. W.—The necessity of rinsing prints between toning and fixing, is because the mixture of the toning solution and the fixing bath causes a decomposition with liberation of sulphur from the hyposulphite solution. 2. A lens when used for copying covers a larger field, because its focus is lengthened, as you must readily see, by the necessity for extending the body of the camera.

JAMES WALLACE.—You may partially get rid of the iodide by hydrochloric acid or other substance which will produce a precipitate and take down with it part of the iodide. See answer above.

H. H.—Continental accounts of M. Leon Vidal's progress with photo-polychrome are very enthusiastic. We have, perhaps, insufficient data to form an opinion, but, on the data we possess, we are inclined to conclude that there is not much promise of its becoming commercially practicable at present. Examples are very scarce. We have had specimens promised for years which have not arrived.

ANXIOUS A. B. C.—The autotype process is the carbon process. You will get full information from the Company's Manual, to be had at Rathbone Place. Mr. Solomon publishes a little work on enamelling.

A. D.—Mastic varnish is made by dissolving gum mastic in spirits of turpentine, about sixty grains of the gum resin to an ounce of the solvent. 2. Gum dammar is made into varnish precisely in the same way; but for photographic purposes, benzole is generally used instead of turpentine.

S. H.—The Autotype Company in Rathbone Place. It is difficult, if not impossible, to copy or enlarge a print to produce a result as good as the original. We fear we do not know an artist to undertake the task.

Several correspondents in our next.

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